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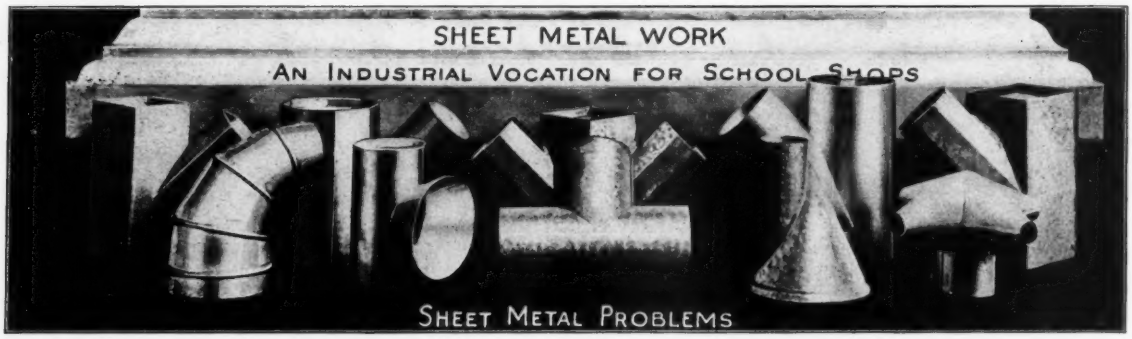

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INDUSTRIAL-ARTS MAGAZINE

Volume X MARCH, 1921 Number 3

Productive Work in the Manual Training Shop

R. L. F. Biesemeier, New Trier Township High School, Kenilworth, Ill.

MANUAL training departments are doing productive work when the students are so organized as to produce a number of similar projects that have a marketable value, as desks, chairs, benches, tables, etc. A manual training department doing productive work in its shops, and having the students organized for producing a number of projects by use of jigs, fixtures and other means of duplication, may be considered similar to a factory producing furniture, machinery, etc., with the exception that in the former case, education of the student is the major part of the product, while that of the factory is production only.

Before the great war, and well up in the year 1916, there was much talk and considerable experimental activity relative to industrializing and vocationalizing education, this being especially true of the useful and practical arts. The leaders in commercial industry and progressives were influenced by economic conditions and made the educators feel the pressure of their demands. The widespread public sentiment, demanding the vitalizing of manual arts by vocationalizing it, could not be denied. In all probability at the present time, if not for the war, many cities would have the manual training work so vitalized that productive work on an industrial or factory basis would be a reality.

Dr. Charles W. Eliot, president emeritus of Harvard University, has said that "industrial education ought to mean trade schools, and nothing but trade schools." This statement must be recognized as extreme and dogmatic. It will not stand the acid test of thinking educators. In fact, schoolmen differ as radically as do the representatives of capital and labor regarding the place of industrial education in the general plan.

We have it on good authority, from those in the industrial and commercial world to whom the educator must go if he wants a measure of the practical value of any course of study formulated by himself that those responsible for our modern curriculum do not realize that there is a wide and deep chasm between the school and the vocation of the individual. Really practical and useful information is not taught. That the work is too theoretical and smacks of too strict an adherence to book lore, is the claim of those who look upon the school work from the outside.

Educators are too often far removed from the common herd to have cognizance of its needs, not associating themselves enough with those engaged in commercial and technical pursuits. One is sometimes led to believe that the educator has been blind to the people's needs and remiss in his high duty; that he has opposed where he should have helped, and followed where he should have led. Undoubtedly the greatest obstacle to the industrialization of vocational education has been the attitude of the conservative educator, which has varied from open hostility to entire indifference.

Justification of Production Work.

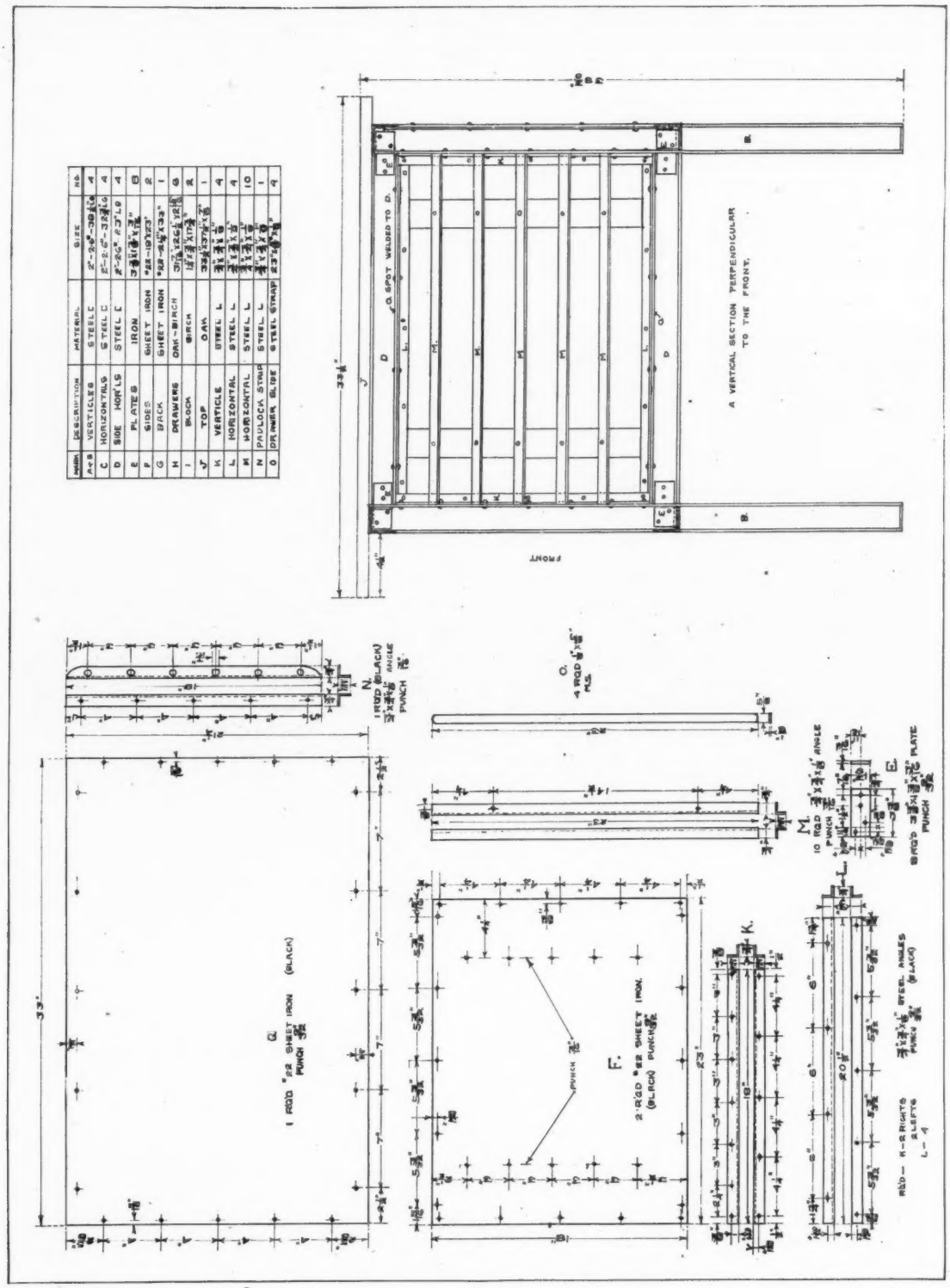
From the first conception of manual training work in the secondary schools and colleges, the idea of productive work was the dominating one. This is evidenced by a number of instances among educational institutions who first installed equipment for manual training work. The equipment was purchased and installed with the view of doing contract productive work. These institutions found that productive work on a commercial basis or scale, for economic gain only, was not profitable or practical when education of the students was given the attention necessary for the best results. Because industry is concerned primarily with material production, while education is concerned primarily with the unfolding of human powers, commercial shop methods should be used for a different purpose than economic gain. Educational value must be the first consideration, and the money value of the productive work must be second.

In many schools a considerable amount of productive work could be carried on in the shops with a good financial return and with as great an educational value as under the individual piece plan.

The justification of productive work in the manual training shop may be divided into two divisions or headings for analysis, namely, educational advantages and material or financial advantages.

The Educational Advantages.

(a) Many of the essentials of an organization, as used in commercial industries, may be brought out in productive work, if handled properly, such as administration, engineering work, cost accounting, management of shop personnel, etc. Opportunity is afforded to study


A VERTICAL SECTION PERPENDICULAR TO THE FRONT.
FRONT
G. SPOT WELDED TO D.
1 RGD "R SHEET IRON (BLACK) PUNCH
2 RGD "RR SHEET IRON (BLACK) PUNCH
4 RGD
1 RGD (BLACK) ANGLE PUNCH
10 RGD ANGLE PUNCH
8 RGD PLATE PUNCH
RGD — R RIGHTS L LEFTS
STEEL ANGLES (BLACK)

DETAILS OF DRAWING TABLE.

processes, capacity of machines and operation, routing of material thru shop. The development of foremen, inspectors, mechanics and engineers may be studied.

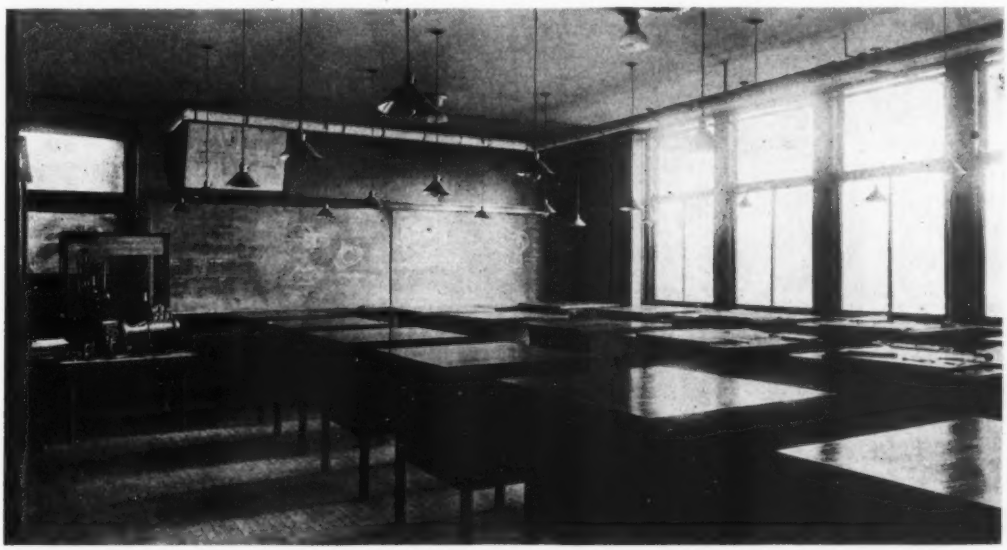
(b) Self-analysis may be brought out by the use of motion or time study for maximum production, which is not only of educational value but of commercial as well.

(c) A competitive class spirit can be brought

about by proper division of the pupils into groups. In an effort to be the leading producing group, considerable thought and unconscious effort will be given to the matter of handling material for maximum production.

(d) Under the productive method of grouping students, many large projects of greater interest to student and teacher as well as projects of greater educational and intrinsic value can be made and a desirable shop atmosphere may be created in this way.

(e) Teachers are kept alive with interest because they must be continuously seeking desirable projects, disposing of finished work, working out processes and perfecting methods as well as selecting a working organization of the students.



DRAWING ROOM IN THE NEW TRIER TOWNSHIP HIGH SCHOOL, EQUIPPED WITH TABLES MADE BY STUDENTS.

(f) It makes possible the correlation of the shops, and mechanical drawing departments to a very remarkable extent.

(g) There is a greater interest in the manual training work by the taxpayers of the community, and makes inapplicable the criticism that our schools do not train for reasonable efficiency in the useful arts of life.

Material and Financial Justification.

The material advantages of productive work in the shops may be found in the ability of the shops to make needed equipment such as desks, chairs, tables, playground apparatus, bleachers, etc., at times when funds are not available for buying ready-made equipment on the market.

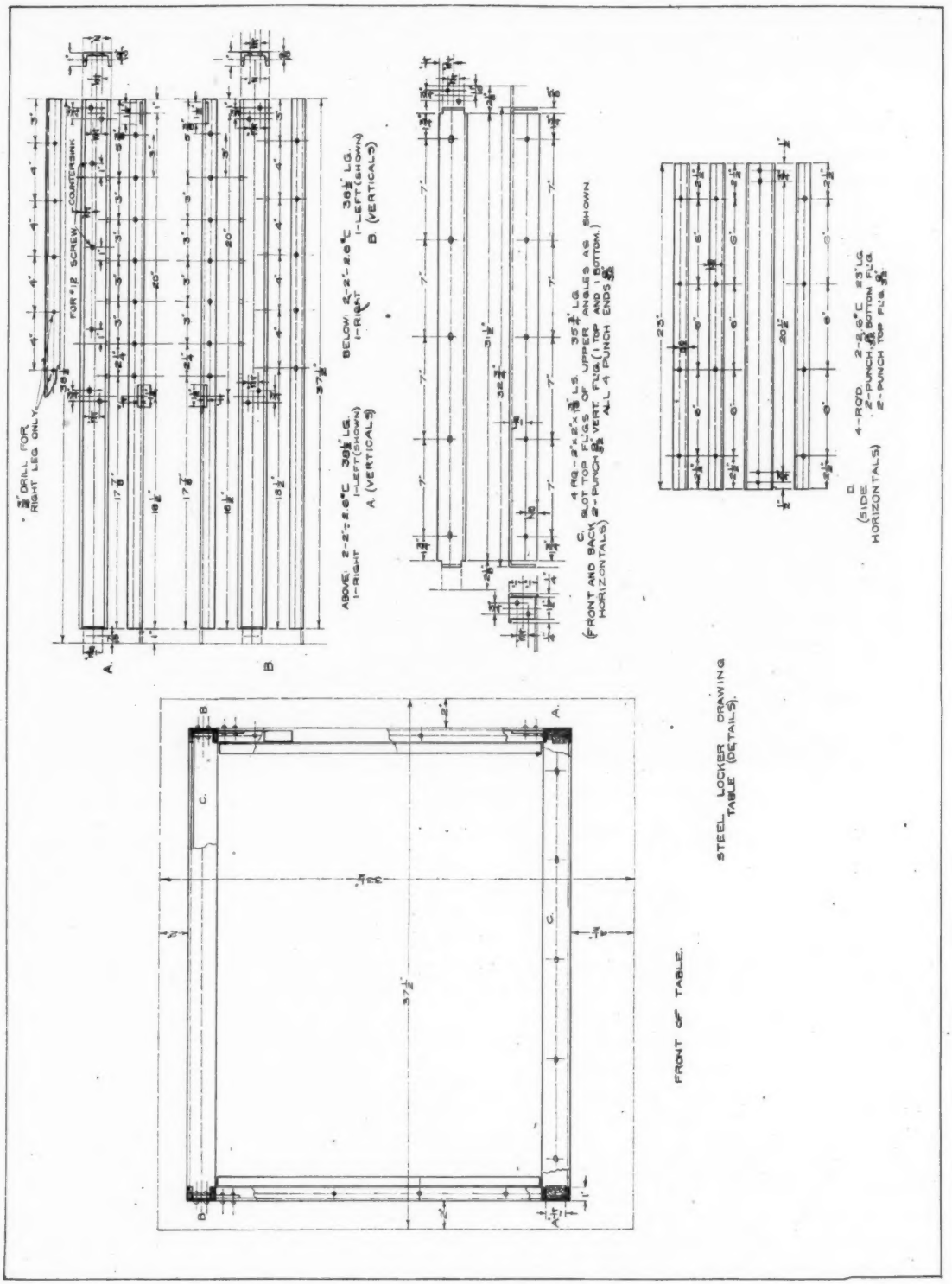
Frequently special equipment is desired and cannot be obtained in the open market. It is here that a good productive shop organization may come in to good advantage.

There is a very small percentage of loss in raw material or stock due to error, and scrap due to cutting. The large financial outlay for an up-to-date manual training equipment makes necessary, from the business standpoint as well as that of the school administration, that some kind of productive work be done so that a portion of the expense of maintaining the department can be carried by the work done in the shops.

Method of Handling Class and Work.

In discussing methods of handling classes doing productive work, I am undoubtedly treading on dangerous ground, because there will be as many different ideas about doing productive work as there are teachers, and all will get results in a greater or lesser degree. Many times the personal equation of the students in the class make necessary a different method of handling. However, I have found the following method to be suitable for most cases. The method of study should be one of participation, that is, it should consist of actual shop experience in producing some article as contrasted with mere information seeking. Only in this way can the school workshop be made an aid in interpreting the industrial world.

The first few days the class is assembled and a series of lectures and demonstrations are given covering the necessary fundamentals, material, processes, tools and machines. Then a series of simple individual projects is worked out by each student, embodying these fundamental operations. This work requires three to four weeks. During this period the teacher can make a careful study of the personal equation of the class and the selection of an organization for the various groups which are to do productive work. Selecting the first group from those best qualified enables the instructor to get the productive work under way with the least possible delay and interruption. It is at this point in the work that the teacher must give practically all of his attention because this first group must be thoroly instructed as to every detail so they may assist in supervising the following groups.



DETAILS OF DRAWING TABLE.

Progressive Organization.

The work is handled by progressive group organizations, that is, each student of the first productive group, when proficient, is given an understudy to whom he must teach all he knows about operating the machine or the hand processes that he is performing.

The first group is then acting as foremen or teachers during the time the second group is learning. The

instructors check up on both groups. When the understudy can be trusted to handle his part of the work without supervision, members of the first group are started on new projects or operations. The second group breaks in the third group; the third group breaks in the fourth group, and so on.

Progressive Projects.

The system should include progressive projects for productive work. That is, the operations on a project as well as various projects for productive work should be made progressive from the standpoint of skill required, interest to student and educational value.

Progressive project work should tie together all the manual training shops and link them with the mechanical drawing department. Types of projects which involve pattern making, foundry work, forging and machine work are the best types of progressive project, because they are in a true sense progressive from the standpoint of physical and mental development of the student, degree of skill required, educational and commercial value as well as being in the same sequential order of progress thru the shop as the student.

Projects requiring the use of jigs, fixtures and other means of duplication to secure interchangeability, as well as to eliminate the possibility of error, are very desirable because it is possible to teach the fundamental tool process to students of poor caliber in a productive way while the project may be going thru the shops in a truly progressive manner.

Under this progressive method of productive work every student has an opportunity to advance to the utmost limit of his ability, because it is possible to keep in progress of construction projects which will require the greatest skill and intelligence as well as some simple enough for those less qualified. Care should be exercised in selecting salable or unsalable projects as this will add much to the reality of the problem.

Disadvantages of Productive Work.

The advantages of productive work, if carried out in the manner as outlined, are so great as compared with the disadvantages that they could be neglected. However, there are some apparent disadvantages which can be classified as educational, personal and financial.

It is not infrequent that we find a certain definite production has been planned and generally this is a rather ambitious undertaking which makes necessary the working of students on a certain piece of work or operation longer than its educational value would warrant. Thus production is given special attention and emphasis at the expense of the educational value.

Personal and Financial Shortcomings.

Under this heading the teacher of manual training as well as those responsible for planning the shop work for the students are to be considered. It is evident to all that if high-grade productive work is to be done in the shops the teachers must be very able. That is, their academic training, trade experience, teaching and organizing ability must be the best. Men who have the necessary qualifications cannot be found in large numbers at the salary available for such purposes. The United States Shipping Board found on investigation that out of 1,098 men instructing workers in the ship yards, the average trade experience was over ten years. If we do or do not agree on the necessity of such training from the pedagogical viewpoint, we must accept the fact that these teachers were very successful in getting results, producing over half a million dead weight tons. However, it is quite difficult to get a teacher with ten years' trade experience who has had sufficient academic training.

When many small projects are produced or a few large ones are made, the material involved may cost considerably. Thus if it is planned to build 25 ready-cut garages, or 25 gasoline engines or 25 oak drawing tables, the question of financing the work might be a serious problem, unless the board of education had the utmost confidence in the manual training department.

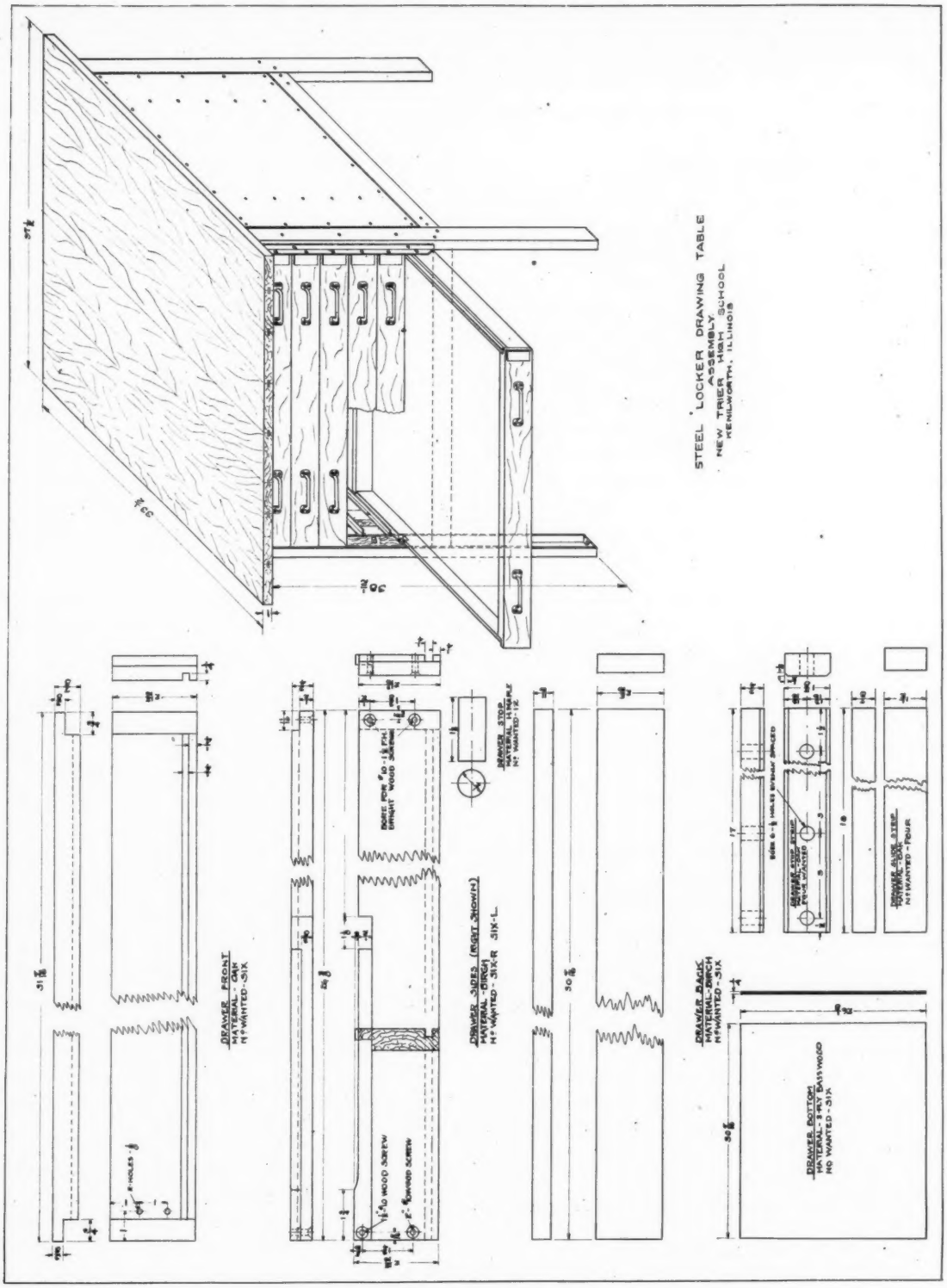
Good equipment is essential for profitable productive work and equipment costs considerable money these days. Therefore, the lack of funds may be a serious handicap to successful productive work.

Production by Beginners.

It has been generally conceded that productive work in advanced classes is a highly desirable thing to do, "that is, after they have developed both the skill-of-hand and skill-of-mind points of view. The educational benefits of such methods begin when those of good individual hand work end, and the factory or productive shop method should be supplementary to the school method and preferably sequential with it and following it." Undoubtedly the more skilful the student in hand and mind, the more successful the productive work would be. However, this seems to be begging the question and following the lines of least resistance, because a number of individual projects were given the student to spoil so that he could develop skill of hand and mind before undertaking productive work. That is, the experimentation was done with individual projects.

The use of jigs, forms and the like to get speed of output is not the essential reason for using such devices in doing productive work in the school shop. Their use enables productive work to be carried on during the early learning period which gives the student a chance to get a good idea of machine operation, the fundamental tool processes, and some knowledge of materials in a shorter period of time than would be possible by any other method. Learning to operate an up-to-date machine tool is quite an education in itself. It enables the operator to become familiar with the construction and design of a tool which represents an evolution and development in machine-tool construction, being the product of the best engineering minds in the country.

It is entirely possible to select projects to build on a productive basis, which have many simple operations, such as cutting stock to length, drilling holes, surfacing, etc., that the beginner can do by use of proper fixtures.



DETAILS OF DRAWING TABLE.

While the operation of the machines is not at all difficult, the opportunity for getting first-hand information on cutting edge tools and their proper uses are unexcelled. Then there is a sense of responsibility, "a shop atmosphere," that is responsible for the students' increased interest and effort which are very essential to the beginner. The proper use of progressive organization and the progressive project will permit of the intro-

duction of productive work as the very first work done by the students.

Example of Productive Work.

The steel locker drawing table is a good example of progressive project suitable for productive work in the school shop and is in use by the New Trier Township High School. The design was worked out after having carefully considered the following conditions: A desirable substantial locker drawer table was needed by the mechanical drawing department, that the tables were to be made by the students in shop work, and that wood and steel should be used in the construction so as to distribute the burden of production over several different shops. It was desired to make the project progressive from the standpoint of the movement of the work and student thru the wood and metal shops. The design must be such that by the use of the proper jigs and fixtures the students could get their very first shop experience by doing actual productive work. It is very desirable to acquaint the student; first, with the material to be worked; second, machines that will be used; and third, the various fundamentals of the work. With this order of procedure in mind, the student must first acquaint himself with the rough raw material as it is found on the market and received from the sawmill or rolling mill. That is, the lumber must be selected so that in the rough sawing the bad portion may be culled out. In getting out the rough stock gives the student an excellent opportunity to learn something of the physical properties of wood and iron and how cutting-edge tools such as the saw, planer, drill press, shear, etc., operate. Thus the student has a chance to do actual productive work in rough sawing, etc., while he is learning some of the fundamentals of doing work. The theory and practice of rip and cross sawing, etc., is taught by the applicatory method, that is, actually doing practical sawing jobs. As the material advances thru the shop and goes from one operation to another and so on to completion, the machine and hand operations require greater care and skill on the part of the student. But he has gained information and acquired considerable skill by advancing with the project. It is very true that this is possible only by careful planning of the work and the use of jigs, fixtures and various methods to prevent error.

ORIENTAL INFLUENCE IN PRINTED TEXTILES

Jean Paul Slusser, New York, N. Y.

HOW many of our young textile designers realize that tho our traditions in printed textiles come to us directly from England and France, practically all of them originated in the Orient, and that at no very ancient date? A study of some of the sources from which the Western textile industry borrowed its original ideas, most of its earlier patterns, should be of real value to the designer who is seriously interested in mastering the secrets of beauty and effectiveness in his art.

Altho it is well known that the painting of cotton cloth with mordants and dyes was practiced in Egypt in the first century A. D., and textile printing from wood blocks was practiced in medieval Germany, our modern tradition in printed cloth originated during the seventeenth century from strictly oriental sources. From time immemorial the decoration of material with painted designs, and to some extent with block printed ones, had been carried on in Persia and India. Early in the seventeenth century these Indian cloths, at that time called "chints," later "chintzes," from a Hindu word derived from the Sanscrit "chitra," meaning "many-colored," "spotted," were being imported in large quantities into both England and France. So popular did they become in England that by 1676 a factory had been founded near London for the manufacture of printed textiles in imitation of the oriental ones, and in 1700 an act was passed by Parliament to protect the infant industry by forbidding the use and wear of all wrought silks, mixed stuffs and figured calicoes imported from Persia, China or the East Indies. This, however, did not prevent the continued smuggling and use of the treasured Indian chintzes.

A German cotton print, 18th century, in imitation of an Oriental pattern. In this can be seen the beginnings of the traditional European style in flowered cotton textiles.

Hand painted cottcn, 17th century, from Amber, India. An admirably simple and logical piece of flower decoration, in which, in spite of conventionalization, the character of the plant is not sacrificed. Notice the fine spacing of the blossoms and the happy filling of the spaces between the stems with other forms.
Thru the courtesy of the Brooklyn Museum.

These Indian and Persian textiles consisted largely of bed-spreads, curtains, scarfs and handkerchiefs, and were all loosely called "palampores," literally "bed-covers." They were very largely painted by hand, or decorated by a combined process of painting and wood-block printing. When painted, the large outlines of the design were as a rule stamped on the goods, by the method of rubbing a perforated pattern with charcoal dust, the painter later working over it with fine brushes. Various processes involving the use of mordants, wax-resist, dyeing as in batik, etc., were used. The colors, three or four in number, were finally so thoroly fixed in the material that repeated boiling only intensified them. Details and repeat motives were often printed from wood blocks cut in relief, very much in the manner practiced today by western textile manufacturers, and in some localities the entire design was block-printed.

The English and French imitations of these oriental textiles were, needless to say, done by machinery rather than by hand; decorating chintzes, by stamping designs from wood blocks or copper plates, was at first widely followed. Parts at first were even tinted by hand, and to a certain extent, the hand block-printing of textiles has been followed ever since in England and France and even in America. But after the invention in 1785 by one Bell, a Scotchman, of copper roller printing, the bulk of textile decoration was done by machinery, and there set in that general mechanizing and debasing of style which is apparently the inevitable accompaniment of machine processes, and which to many critical observers has seemed to spell the death of art.

It was nearly a century later that William Morris, in England, made his famous stand against this kind of machine-made ugliness, and so beautiful were many of his designs that many of them are in use to this day, and his work practically constitutes a distinct style. His designs were based partly upon a study of the best medieval European types of ornament, and partly upon a fresh observation of nature herself. Tho Morris, like all true artists, made a gospel of beautiful workmanship and gave first place to the hand-made in everything, he recognized the necessities and demands of modern life

Hand-painted palampore from India. Tree of Life design. In spite of the elaborateness of the flowers, they are always clear and logical in outline. Observe how the all-over quality of the design is maintained thru recurring different spots.
From the Metropolitan Museum of Art.

A set of Persian tiles dating from the end of the XVI century. The original in turquoise blue, ivory, demon-yellow, green and brown, is one of the loveliest examples of Persian art in the Metropolitan Museum. The flat decorative treatment of trees, flowers and figures is worth a great deal of study, as well as the general flowered all-over effect, similar to that of a good chintz. Worthy of close attention, also are the patterns in the women's dresses, probably block-printed calicoes, or possibly silks.

and created many designs for machine reproduction. His patterns were so rich and varied in rhythm and spotting that, even when machine printed, they escaped that look of hardness and fixity so characteristic of the usual machine product. But in spite of the great work of William Morris and his disciples, in improving the tone of the better grade product, the great bulk of machine-produced work in the textile as in other applied arts, still remained under the curse of Victorian naturalism and the blight of crude coloring and machine-like rigidity of style.

In America, where conditions have been as a rule, even worse as regards taste than in England, it has been only in very recent years that designers of textiles have realized the possibility of creating a type of design for machine reproduction that shall still preserve some of the charm and the delightful slight irregularity of the hand-made products. In this attempt our designers have been aided by the modern vogue of hand processes —block-printing, stencilling and batik—and by the comparatively recent revival of interest in oriental design, stimulated in part by the recent popularization in the west of the beautiful medieval miniature and manuscript illustrations of Persia and India.

In these delightful decorations and in the lovely painted and printed spreads from Persia and India, now to be found in nearly all our museums, and occasionally in somewhat debased modern form still on the market, the designer will find material abundantly worthy of his closest study. Here as in the tiles, pottery and rugs of these same wonderful countries he may hope to come upon some of the fundamental secrets of beauty and effectiveness in design. In all these types he will recognize that with their makers the design was the thing,

A Persian miniature illustrating the strictly decorative treatment of figures and landscape. A delightful spring-like quality is obtained by the use of flower-spots thruout the composition.

Cloth Mosaic, 17th century, from Amber, India. A particularly beautiful example of the use of flowers in textile decoration. To be noticed especially are the grace and rythm of line, the simplicity and delicacy of the flower-forms, the interesting grouping of the spots, and the effect of flatness maintained thruout.

Courtesy of the Brooklyn Museum.

and that even when using natural forms they never made the mistake of trying to decorate a flat surface realistically, in other words with a picture. Flatness of surface, that first great essential of all good decorative design is here everywhere achieved by an absence of perspective and of modeling and by the all-over spotting of the various colors. In the textiles are especially noteworthy the rhythm of line, the interplay of brilliant yet harmonious colors, the delicacy of detail and the skill with which the surface is enlivened by an all-over "starring" or spotting with points of interest, usually flowers or flower-like forms. This trick of starring or spotting the surface to be decorated, so peculiarly valuable in textile designs as what modern worker in batik has not discovered for himself, is really hinted at as mentioned before, in the word "chintz" itself.

Designs of actual flowers have not to be sure, always been, and need not, necessarily be associated with chintzes or cretonnes (the French term comes merely from the name of a village in France famous for its weaving). Yet in a true chintz pattern there is something of the growth of flowers, in the repeated spotting of the surface by points or masses of interest. In the original oriental textiles, of which the earlier continental chintzes were imitations, there is an effect as of meadows starry with flowers, and trees bedecked with leaves and blossoms. Not for nothing did the rose and the jasmine and the peony bloom in those Persian gardens of which the poets tell. In all Persian and Indian art there breathes somehow a spirit as of eternal spring and eternal blossoming. It is a part of the charm for us of the art of those lands. And yet analyzed from a designer's point of view, this effect is very largely a matter of the mere skillful repetition of spots. They are delicate and beautiful spots, no doubt, and yet their effectiveness is probably more largely a matter of their skillful disposal upon the surface than of their individual beauty of detail.

In many of our western designs there is a feeling of rigidity as of stone or iron work. For some of this late Renaissance design, with its trick of imitating carved and sculptured architectural ornament of wood or stone or iron in other materials may be held partly accountable. But we tend to imitate in art the things we live among. Perhaps in an age of steel and brick it is not surprising that a certain amount of steeliness and brickiness should get into our art. But let us leave the expressing of such things to our architects and to our Post-Impressionist painters. Textiles after all are soft cloths to be decorated with designs which shall make them look like soft cloths. And nature is still around us, and the love of nature is no less strong in us than it is in the people of the Orient. Our designers will always draw upon nature and natural forms, as they have done in the past, for the greater part of their inspiration. And they will find it to their advantage to study, without ever giving up their own conception of nature, how some of the earliest and surest designers in the world and the creators of some of the most beautiful textiles, have found ways of transmuting natural forms into the material for their art.

Needs of Secondary Technical Education in Nova Scotia

Gerald A. Boate, B. Sc., Assistant Director of Technical Education for Nova Scotia

IN order to determine the types of secondary educational systems which will best suit the Province, city, town or community, a careful analysis should be made, not only of the natural resources, but the dominant types of producing, manufacturing, distributing and trading.

To have a healthy state of industry and trade continue and improve, there must be skilful and conservative utilization of the products of the mines, farms, forests and coastal waters. The natural resources of Nova Scotia are principally mines, forests, farms and fisheries; producing, in the mining group, iron ore, coal, gypsum and in smaller quantities gold, silver and manganese; from the forests are obtained spruce, fir, hemlock, beech and birch; agriculture is principally mixed farming, exporting apples, potatoes and hay; the fisheries group, from an exporting standpoint, is the second in importance, sending to central Canada, the United States and the West Indies canned, dried and salted fish.

In order to improve her condition and increase the status and wealth of the Province, it is not only necessary to produce more, but to produce more economically and efficiently. Coal, iron, timber, fish and deep harbors abound. Why, then, is not Nova Scotia more prosperous than she is? Are we too far north or too far out in the ocean, or do we depend upon the rest of a great continent to supply or manufacture our needs and wants? Is our geographical position less favorable than Massachusetts, which is almost devoid of natural resources, yet supports a large and prosperous population, principally by importing raw materials and thru enterprise and skill, converting them into a marketable product which usually bears the hall-mark of excellency of workmanship to such a degree that the products are eagerly sought by a world's markets.

The comparison is made merely for the purpose of deducing, if possible, the reason for Massachusetts' prosperity and development. The civil war left this State almost devoid of able-bodied man power; as a consequence brawn gave place to ingenuity, and for fifty years after the close of the war there was a period of inventive development which was unparalleled. The invention and development of new devices and machines for the working of metals awoke Boston, Worcester, Fitchburg, Holyoke, Lynn and many other cities to such a state of activity that their populations multiplied and wealth poured in, yet this State cannot show in its list of natural resources either coal or iron. Lowell and Lawrence are celebrated the world over for their cotton mills, but the State of Massachusetts does not raise a pound of cotton. This State dominates the world market for boots and shoes. The hides from which the leather is made are imported from Australia, India and South America. The arms which gather in the raw materials also carry back to the remote corners of the earth manufactured goods. How did this condition come about? Ingenuity alone accomplished it. Capital, a vision backed by honest effort, faith and skilfully trained workers accomplished the miracle. Schemes, dreams and plans were followed by action. From small beginnings mighty organizations were built up.

The demands for constructive effort are greater today than they ever were before. Iron, steel, timber and the fabricated products thereof are needed in unlimited quantities by the civilized world. In order that these materials may be developed into a more refined and acceptable state for efficient shipment, it is necessary that the minds of the people of Nova Scotia be directed to the desirability of providing intensive training for those who are developing the natural resources of the Province. In doing this it will be well to consider the group of workers who fall outside of the professional class.

As a very conservative estimate, not over ten per cent of those who graduate from high schools ever enter professional colleges. We may well pause to consider the vocations of the ninety per cent, who do not attend higher educational institutions, and also the vast army who do not attend school beyond grade eight. What becomes of the boys and girls who drop out of school? Why do they drop by the educational wayside? We do know that they drop out of school, but they also drop into something else. Business and industry absorb the school discards and immediately place them at work "doing something." Without much further assistance they either again drop out or pick up enough training by imitation, to enable them to carry on mechanically, without knowing the cause or reason.

When production is low, or a period of depression comes, the plants where some of them are employed close down, workers are dismissed and become unemployed. The unpleasant task now confronts them of seeking a new position, which, on being analyzed, is one of the most difficult tasks of modern salesmanship—to sell one's own services. What has this uneducated boy or girl to sell or offer a prospective employer? Without assistance the salesmanship is usually so crude that the former experience gained in the previous position is lost in the shuffle and in a majority of cases an entirely new start is made. In this process of drifting from one place of employment to another without guidance or assistance or maturity the worker is classed as a "hand" or common laborer.

Business managements, like political governments, are coming to realize that the basis of any permanent reform must begin and end in education. The tendency to adopt this point of view is indicated by the following examples:

The New York Edison Company, a public utility, selling light and power, offers educational facilities thru its educational bureau and the educational committee of the local association of employers. The committee prepares technical and accounting courses in which the attendance is voluntary. The educational bureau prepares the commercial courses as part of the routine work of the commercial department, and instruction is given on the company's time. These courses include hygiene, health and recreation, the basic principles of salesmanship, company organization, the elements of central station business-getting, and the fundamental principles of electricity. The term begins in October and ends in May. The work covers two years. The school staff consists of a manager, several instructors and a secretary. The technical courses consist of laboratory exercises, preceded by a talk in which the instructor outlines the work briefly. The course lasts fifteen weeks each year, five evenings and one afternoon per week. Besides these courses the company has lectures given by their officials or by prominent speakers on general and public policy, etc., and on technical subjects.

Special training for the company's work is given by the National Cash Register Company, which has established an agents' school for salesmen, one for advertising men, and one for officers for the study of business management, and others for the general staff. This company has a kindergarten for the children of the employees, and cooking, sewing and millinery classes also, as it is realized that any training which benefits the home makes better workers.

The Canadian Pacific Railway provides an apprentice school at the Angus Shops at Montreal. All apprentices are required to attend this school a definite number of hours each week on the company's time. The subjects taught are English, mathematics, mechanical drawing and science. Scholarships are offered by the management, which are sufficient to provide full tuition fees and maintenance of the winners in engineering courses at McGill University.

These examples are merely typical of the conscientious effort on the part of large employers to better the conditions and environment of their workers, as a means for merited advancement. Examples of similar educational efforts could be added to by the score, but those mentioned are typical of this new movement among the most progressive corporations.

The company continuation school is rapidly working its way into all progressive systems of vocational education. The motto of such schools is, "Learn while earning." It is marked by a somewhat broader educational outlook than the company business school. Accordingly we find classes in English, mathematics, history, civics, geography, spelling, hygiene, typewriting, shorthand, sewing and dressmaking. These are all in addition to a number of other subjects directly related to specific occupations, such as engineering, drafting, machine operating, office work, laboratory testing, telephone operation and salesmanship.

Of this kind there are two groups; those schools conducting evening classes and those holding day sessions. The methods of instruction are as varied as the subjects taught, but each type is actuated by the dual aim to make more intelligent and responsible citizens and more efficient employees. The public or private continuation school is cooperative in its nature and requires that the instruction involves both study and practice. The studying is done, however, at the public school and under its direction, instead of being done with the company, and the industrial training is carried out according to a definite plan in industry. This method necessitates the closest kind of cooperation between business organizations and the public school. However, the practicability of this educational method is proven by the increase in the number of firms which are using it.

The development of any secondary educational system, like the development of any national, civic or individual enterprise, requires the expenditure of large sums of money, and in order that funds may be conserved and made to do the greatest amount of useful work careful planning is necessary. The need for developing special secondary technical education in Canada was felt prior to 1910. In 1910, at the request of the Minister of Labor, Order-in-Council No. 1133 was approved by His Excellency, the Governor-General of Canada, on the first of June, an abstract of which is quoted:

"On memorandum dated May 28th, 1910, from the Minister of Labor, stating that the industrial efficiency is all important to the development of the Dominion and to the promotion of the home and foreign trade of Canada in competition with other nations, and can best be promoted by the adoption in Canada of the most advanced systems and methods of industrial training and technical education.

"The Minister further states that the premiers of the several Provinces of the Dominion have expressed on behalf of the governments of their respective Provinces, approval of the appointment by the federal authorities of a Royal Commission in Industrial Training and Technical Education."

The Commission, after being appointed, investigated scientifically and exhaustively first the educational systems of Canadian provinces, then it proceeded to England, Scotland, Ireland, Denmark, France, Germany, Switzerland and the United States. The report of the commissioners was printed by order of the Federal Parliament and distributed in 1913. The work of this commission resulted in the passing of the Technical Education Act in 1919. This act provides for aid to the provinces in promoting and assisting technical education in Canada, by annual grants beginning at $700,000 and aggregating $10,000,000 within a period of ten years.

If the federal appropriation for developing secondary technical education is matched dollar for dollar

by the provincial government, Nova Scotia will have a fund of $116,000 to be expended during the fiscal year 1919-1920. The problem confronting the administrators of the fund is how this amount can be best expended to meet the immediate needs of the province in the advancement of technical and industrial education, at the same time getting the desired maximum of permanency from the investment.

Within the last ten years in the larger cities of Europe and the United States special technical high schools have been built, the buildings and equipment costing from $2,000,000 in the larger and more elaborately equipped structures, down to $75,000 in the smaller types, usually converted wooden buildings. Usually such schools are designed as a general high school, so far as academic rooms are concerned, but in addition space is provided for: (1) Mechanical and architectural drawing, (2) machine shop, (3) sheet metal and plumbing shop, (4) electrical testing and applied science laboratory, (5) chemical laboratory, (6) building construction and electrical wiring rooms, (7) power and hand-working shops, (8) applied art and design rooms, (9) painting and decorating rooms, (10) domestic science kitchens, (11) dressmaking rooms, and (12) millinery rooms.

The special aim of such a school is to serve both day and evening classes. Special emphasis is laid upon the newer aspects of school work, and practical subjects are given a generous allotment of time. The elements of a liberal education are, however, by no means neglected, but are made more interesting because enriched and vitalized by a new content and purpose. Syllabi of courses are so arranged by the group method of instruction that those possessing satisfactory high school entrance certificates may elect courses which lead to college matriculation, thus laying a splendid foundation for applied science college courses. Other courses are designed to lay a foundation for entrance into industry or commerce after leaving high school.

Usually the work covers a period of four years. Cities always have another group who enter a technical high school with the specific purpose of learning the fundamentals of a trade or occupation which will give them an entrance, at an early age, into remunerative employment. The educational standard set up is usually successfully passing grade eight examinations, or sufficient education to profit by the instruction given in the classes, and to be at least 14 years of age. These groups are given either prevocational or vocational courses. The first year they are in the boys' division, routed thru the various shops in order to determine their mechanical aptitude. When mechanical skill or fondness for certain commercial work is apparent they are counselled by their instructors regarding the vocation which they might advantageously follow. The girls are likewise routed through the home-making, art and design, cooking, sewing and commercial rooms.

The courses usually given are machine shop practice, automobile mechanics, carpentry and joinery, sheet metal work and plumbing, architectural drafting, mechanical drafting, building construction, applied physics and chemistry, applied mathematics, grammar, composition and spelling, geography and history, industrial art and design, household management, home nursing and hygiene, domestic science, dressmaking and millinery, study of textiles and materials, physical culture, music and French. In the day school the student program may be general, leading to matriculation, or special, leading to diploma which states definitely the special work covered. In the evening classes single subjects are usually selected by industrial and commercial workers, who avail themselves of evening technical school for improving their training.

The types of secondary schools which have been developed during the last fifteen years in Canada and the United States include technical high schools, trade schools, industrial art schools, continuation part-time schools, correspondence schools, vestibule schools and upgrading schools in industry, commercial schools, university extension courses, home economy training centers, women's institutions and classes. The chief difficulty lies not in establishing schools of technical nature, but in selecting from the large array the types and forms of training which will best suit the needs of the entire Province. The chief industries of Nova Scotia are iron and coal mining, the manufacture of iron and steel into products of these metals, including machinery, lumbering, agriculture and fishing. Each division is large and has many subdivisions, which are capable of development and expansion in order that the pulses of our trade and commerce may be filled with richer blood of new endeavor.

From a broad viewpoint it seems wise, for the present at least, to defer expending large sums of money on the erection of secondary industrial school buildings, and to devote our untiring energies to the serving of our industries at their doors by bringing the most desirable training to the workers at their daily tasks. This may be satisfactorily accomplished in several ways:

For the coal mining industry, the development of more advanced instruction in the present coal mining schools, cooperating with the managers of the industry in providing both evening and part-time day classes.

For steel mills, machine shops, foundries and factories, in the establishing of vestibule schools within the industry, the equipment to be supplied by the manufacturer and suitably trained instructors to be provided by the province, for the more efficient training of junior employees or apprentices, space to be supplied either attached or detached, for classrooms in which to give instruction in mathematics, drafting, English, history and civics, either by the manufacturer, the community or cooperatively.

For business and commerce, the development of business schools which will fill the needs of part-time day and evening students, so that training will not only

be in business correspondence, English, spelling, grammar, penmanship and bookkeeping, but will embrace the fundamentals of salesmanship, factory and office management, commercial law, modern languages, and also the economics of business and sufficient training to give a comprehensive understanding of the laws which govern capital and labor.

Forest conservation and reforestation and educational work which will lead to the economic use of the products of our forests are highly desirable. Also the extended manufacture of lumber into marketable products.

The fishing industry, which employs 27,000 Nova Scotians, offers a fertile field for the advancement of training and skill. This refers to deep-sea fishing. In order to attract a larger market and demand relatively higher prices there must be improvements in the methods of pickling, drying, smoking, canning and distributing the fish product. In this field courses of an extremely practical nature can be given to the fishermen in the care, operation, repair and overhauling of gasoline marine engines, in navigation at the fishing villages during the winter months, which will shorten the period necessary at the government navigation schools, in the testing of salt and brine solutions for purity and density, and the sanitary methods of handling the catch while at sea; and short courses in bookkeeping, penmanship and business, spelling, marketing, banking and exchange. Further developments of educational work which will assist the fishing industry will be planned and executed as soon as funds can be provided and cooperation arranged.

Already splendid work is being done at the Provincial Agriculture College at Truro, in general and special agricultural subjects. However, much assistance can be given agriculturalists by giving special courses in the care, repair and overhauling of power apparatus and power driven machinery, as gasoline engines, steam boilers, tractors, pumps, grinders, threshers, sulky-plows and all mechanical appliances which are rapidly appearing on Nova Scotia farms, and the correct handling of which needs working knowledge of mechanics and applied electricity and the correct use of machinists' tools. The training should be in the actual overhauling, taking down, assembling, testing and adjusting, the renewing of wornout or broken parts, and economic operation. Some practical training in the use of blacksmiths' and carpenters' tools and harness repairing is desirable.

Emphasis should be placed on the extension and expansion of the evening technical schools in order that they may serve more fully the needs of the larger communities.

Those in rural districts, or so engaged that it is impracticable, should have their interests cared for by means of correspondence courses, on which such a satisfactory beginning was made by the Nova Scotia Technical College, but which had to be suspended during the war. In the preparation of the lessons and the selection of the subject matter every effort should be made to establish a bureau which will radiate a warm personal relationship and be of the utmost service to the people of the province. The courses should be short and extremely practicable, and so prepared that they will assist in their work the carpenter, the builder, the mason, the draftsman, the machinist, the plumber, the electrician, the steam engineer, the garage mechanic, the sheet metal worker, etc., and for women, dressmaking, millinery, home nursing, household management, and general education for both sexes.

Industrial training and technical education serve to supplement general education with special reference to the requirements of workers in the industries, agriculture, commerce, transportation, mining, housekeeping and other occupations. They are the means whereby the individual, the family, the community and the nation seek to develop the powers of the individuals for work, to prepare themselves to meet the conditions of working life, to alter those conditions in directions which seem desirable, and to conserve what is esteemed to be worth while in knowledge, customs, methods, institutions, standards and ideals. In order that all might become qualified to the full extent of their capacities to fill their places as individuals, as contributing earners, as citizens, and as members of the race, the present and future development of technical education and industrial training in the Province of Nova Scotia will be planned and administered to fit the fuller needs of Nova Scotians.

PAPER CUTTING BY A VIENNESE SCHOOL BOY.

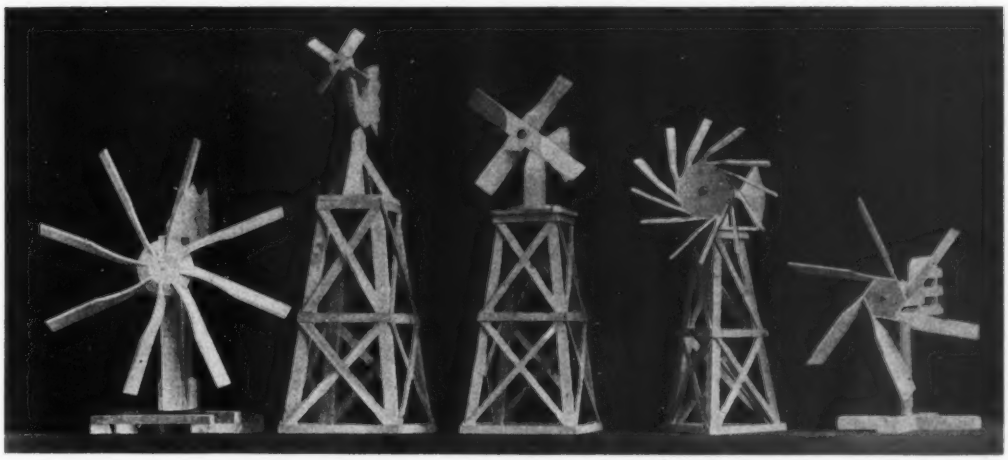


FIG. 2. TYPES OF WINDMILLS MADE IN THE AUTHOR'S CLASSES.

Teaching Fifth Grade Woodwork—The Wind Mill

Fred L. Curran, Supervisor of Practice Teaching, Stout Institute, Menomonie, Wisconsin

THE fifth grade boy is full of life and energy. He is interested in moving things and in making things that move. He is probably a "self-starter" in almost any line of endeavor, and if he had his way, everything would be running on "high speed" most of the time. Because of this some of our industrial arts work in the fifth grade has not been suitable. Either it was not the type of work that the boy was interested in or it took too long for the boy to get results.

Thru years of experimenting we have eliminated many forms of handwork in the fifth grade. We have tried bent iron work, paper and cardboard work, weaving, basketry, clay modeling, whittling, coping saw work and bench woodwork. Some type of work involving the use of a few common woodworking tools seems at present to be most in favor. The hammer, back saw, coping saw, try square, rule and compass are the principal tools used. The plane and chisel may be used, but they should probably be used more as a necessity in bringing in a variety of projects.

Difficulties in Teaching Grade Woodwork.

Much of the difficulty in teaching fifth grade woodwork comes thru the types of work which have been attempted. To select and design problems which boys at this age can make fairly well and in short enough time to hold their best interest is not an easy task. We shall probably find, however, that by omitting most of the planing and by having most of the stock reduced to thickness and width in the mill we can offer many problems which are satisfactory. Because of the necessity of having much of the lumber reduced to two dimensions in the mill it will effect economy to standardize sizes as much as possible. In the windmill project described in this article, there are only five sizes of stock and these same sizes can be used in many of the other problems of the course.

The Wind Mill Project.

The wind mill fulfills most of the requirements of a satisfactory problem in the fifth grade. It is rather easily and quickly made; it has moving parts and will be taken home and fastened up somewhere by most of the boys. The stock is all cut to thickness and width in the mill. The work left for the boy is to make measurements accurately, cut to line carefully, and assemble in such a way that the finished result—the wind mill—shall stand plumb and square and run well.

In teaching the wind mill it is necessary that the teacher demonstrate each step carefully and completely. He will demonstrate the making of one complete side of the tower, making sure he has selected a good way for the boys to determine the slant of each of the two posts. When some in the class have completed one side he will demonstrate the nailing on of the strips on the third side. The teacher will also demonstrate the laying out and cutting of the cross lap joint in the wheel and the laying out and cutting of the blades of the wheel. The cutting of the blades is best done with a sloyd knife or a jack knife. The making of the vane, fastening it to the beam, making the short post and fastening it to the platform, all will need demonstration. The final lesson of balancing the wheel, boring holes, assembling and trying out in the wind or in front of a hot air ventilator, will be most interesting of all if the teacher enters into the spirit of the occasion and inspires the boys to feel the value of accomplishment.

What Have the Boys Learned?

Besides the general dexterity in the use of tools in construction work, and the knowledge gained thru the use of the tools, there are some definite points of value in the wind mill problem. First, the boy should learn a few simple facts regarding braced construction,—where they are used, and the strength and rigidity produced by the cross bracing. He should also learn the best ways

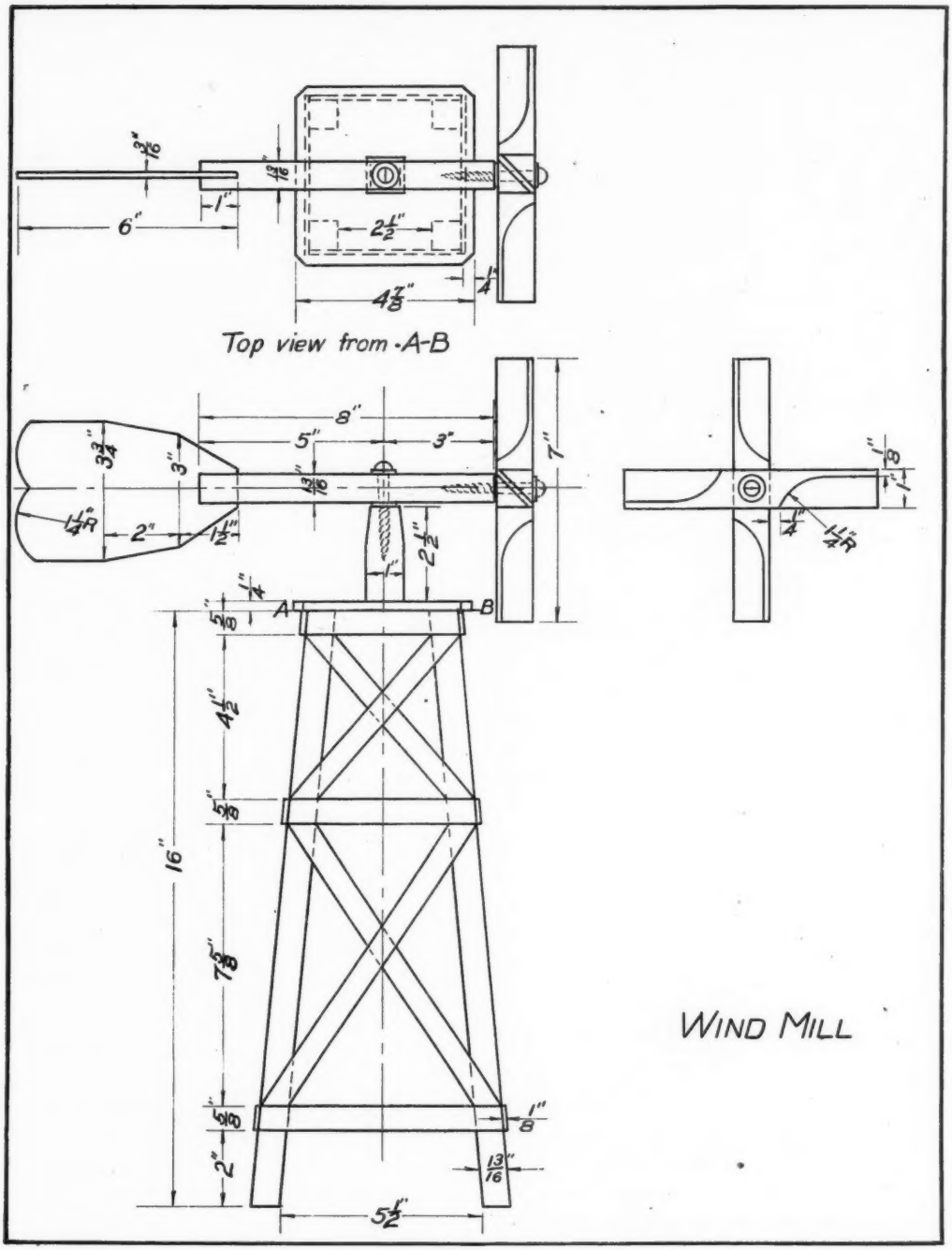


FIG. 1. DETAILS OF WINDMILL FOR FIFTH GRADE WOOD WORK.

of nailing on braces. Second, he should learn to do some thinking and planning in a construction of this kind. He should be led to ask himself, "What is the best way to go at the making of this tower?" "What shall I do first?" "How can I test it to see if it stands plumb or straight up?" Third, he should strengthen his powers of observation with reference to just *how* the wind turns the wheel and as to whether the angle of the blade makes any difference in the amount of power produced. Boys at this age will not, of course, think very deeply into any of these problems but they should be led to think in these directions and led to observe the things which later on will furnish a foundation for scientific study.

In Fig. 2 several types of wheels are shown. Some of these may be used in the fifth grade, but most of them are better suited to sixth-grade classes.

UNIT HIGH SCHOOL COURSES IN PRINTING

R. A. Loomis, Instructor in Printing, Dickinson High School, Jersey City, N. J.

The student who enters the printing course in the high school need not become a printer, any more than that he become a chemist if he take up the course in chemistry. Printing is an excellent subject for general educational purposes, and any student in any department of the high school may take printing with much benefit.

What work is there that enters more into the daily life of the people than printing! And yet, how few people are there who are informed about printing processes! As you read these lines, do you know how the words are made to appear before you on paper? Have you any idea of how paper, type and ink are manipulated to produce a printed page? Do you know anything of the history of the methods used to record events from the beginning of crude markings on stone, to the present highly developed technical processes ot printing?

Printing with movable types was one of the most important discoveries that came near the end of the middle ages. Printing with lines of type is one of the great inventions of the nineteenth century, the work of several Americans. Almost daily, new improvements are made in printing so that the public may have more and better printed books, magazines and advertising.

The high school course in printing cannot only give elementary training leading to the trade, but at the same time, it can be one of the important subjects in a liberal education. In the institution with which the writer is identified, any pupil in any of the three departments—academic, commercial or industrial—may enter the printing class. Of the students who do enter the class, some became interested enough to become quite proficient so that they do well when they enter the trade. The instruction offered is general, as well as specified, and brings interest along the line of several of the industries connected with printing. We might recount here the experience of a number of successful young men who have taken up machine composition, advertising, etc.

The dual purpose of the high school course in printing requires that the work be organized quite differently from the courses in a trade school. The fact that many students entered the class for general educational purposes, while others have distinct vocational plans in mind, and the fact that many of the former students will possibly enter the trade, makes it necessary that the work be general and broad, and at the same time, technical enough that all fundamental principles be thoroly mastered and practiced. It is perfectly possible to accomplish this by organizing the work, so far as the trade is concerned, in unit courses and by giving the academic, or general information, in class talks and in supplementary problems involving printing, design and layout work that will result in good judgment concerning the selection of type and the arrangement of printed pages.

In order to accommodate pupils at any and all times of the day, in any numbers, and for irregular periods of time, the unit course seems best. Thus, by organizing group classes, to meet once or twice each week, it is possible to reach all in the shop with actual shopwork, lectures and layout work, and to make the training and information adequate.

The organization of unit courses of instruction in printing divides itself into three natural divisions—trade work, academic work and layout work. The trade work is first given. The pupil learns the simple elementary operations of hand composition and follows his job thru proofreading, imposition, presswork and distribution. He does several jobs which are elementary and simple, until he is competent to carry any ordinary job thru. In class work he is instructed in the methods of doing these several trade operations. After he has become sufficiently proficient in the simple work, he is given more difficult jobs and the class work becomes more academic in character. General informational talks are then given on processes in industries related to printing. After the student has become quite familiar with type faces and has acquired some ideas about the arrangement of type thru shop practice, layouts and study of specimens of printing, he is then ready to undertake layout work and to express himself in printing design.

Unit courses given below have been developed by the writer in the Dickinson High School as a result of several years of teaching experience. They seem to be perfectly adapted to attain results in the writer's classes. Only the titles of each unit are given, but a few questions are added to indicate a part of the content of the unit, and to give a clue to the information which the teacher may demand.

CONSECUTIVE OPERATIONS UNITS IN PRINTING.

The following units cover the ordinary operations in consecutive order that a printer must perform in producing a printed job. Each operation is fully described and where necessary diagrammed. It is intended to guide the printer thru the different parts of the work from composition to distribution.

In order to give an idea of the content of each unit a few questions are given after each unit.

OPERATIONS UNIT 1.

In this unit the beginner learns the case; to hold the stick; to remove type from stick; to tie up the type; to set the stick to even picas.

Questions:

Why is the type case arranged as it is?
What is the most convenient way to hold the stick?
Describe how to remove type from the stick?
Describe the point system?
Diagram the proper position for type in the galley?
How is the stick set to even picas?

OPERATIONS UNIT 2.

It is expected that upon completion of this unit the student will be proficient in the proper practices in paragraphing, justification and grammatical applications to typography.

Questions:

When and how is a line properly justified?

Diagram and explain the naming of spaces and quads?

What is a pica, nonpareil, point, em?

Distinguish between p and q in type?

Describe how a paragraph should properly end and begin?

Write six words that should not be divided?

How should the quads and spaces be arranged in ending a paragraph?

What is a slug, reglet, metal furniture, metal quotation, lead, descending letter?

OPERATIONS UNIT 3.

After having completed the work in this unit the young printer should be able to take a proof, mark proof, and correct the type according to his corrected proof.

Questions:

Describe how to take a simple wet proof with a proof planer?

Write and explain the meaning of ten proof marks?

What is a "run over"?

What is an "out"?

Describe how a correction should be made in type?

OPERATIONS UNIT 4.

This unit teaches the proper method of locking up a job for the platen press.

Questions:

Diagram and label a simple locked up form.

What is a quoin?

What is the proper order to lock up quoins?

If type falls or pushes out what should be done then?

What is the key?

Why is it better to lock type with the head toward the left?

OPERATIONS UNIT 5.

The very beginnings of presswork are explained in this unit. The student's first printing exercise is made ready on the press.

Questions:

What can be said about preparing the press for the job?

What is the tympan sheet and how is it attached to the press?

How is a job centered on the press?

OPERATIONS UNIT 6.

The proper way to feed the press and something about presswork are explained in this unit.

Questions:

What is presswork?

What is the tympan?

What are the grippers?

Describe how to feed the press properly?

What causes offset?

OPERATIONS UNIT 7.

Something about stock cutting is learned in this unit.

Questions:

Describe by an example how to figure stock cutting.

Why is it good practice to place a sheet of cardboard under and over paper while cutting it?

What are some of the common sizes of card stock, book paper and letter paper?

How many sheets in a printer's ream?

OPERATIONS UNIT 8.

This unit has to do with the final operation in printing: distribution of the type.

Questions:

Describe how to remove type from the chase.

Why is it necessary for the distribution of type to be done accurately?

What can be said about the distribution of spaces and quads in the process of distribution?

SUPPLEMENTARY UNIT.

In this unit practice is given in the figuring of type for space areas. By the use of a table any amount of copy can be figured to fit a certain amount of space or the number of words in any given amount of printed matter may be estimated.

UNITS IN LAYOUT WORK.

UNIT 1.

Straight Composition Exercise in which the student learns how to fit a certain number of words to a certain space area. Rudiments of layout in which the customary methods of dimensioning are learned and the proper way to label layouts is practiced.

This exercise is a description of straight composition and distribution.

Questions:

Describe how the number of words in any type page may be estimated.

What is the method for estimating the number of words set in a certain size of type that a type written page of copy will take?

How should a layout be labeled to show length of lines of type and length of whole composition?

UNIT 2.

Straight Composition with an Initial Letter.

In this exercise the pupil learns how different kinds of initial letters are used so that they will harmonize with the text.

Supplementary exercises using the initial letter give experience in setting compositions in capital. General shape of letter is made to harmonize with the general shape of the composition in another.

Questions:

In using an initial letter what should be the character of the letter to look well with a Roman type face?

UNIT 3.

Straight Composition with Initial Letter and Border.

This exercise teaches the proper use of borders. The kind of border for the character, shape, style, size and kind of type to be used for a certain kind of work is studied.

Questions:

If an advertisement for a millinery store is being set what kind of a border should surround it?

UNIT 4.

Straight Composition Exercise in which the Initial Letter or the Border may be run in Color.

Colored borders and initial letters in combination with body matter in black are studied. This is more easily done by studying the work of others.

Questions:

If a quotation card is wanted to be set in a horizontal rectangular shape with a border and initial letter in color what kind of an initial letter should be used if an expanded body type is to be used?

If a vertical rectangular quotation card is to be arranged what should be the general character of the body type and the initial letter?

UNIT 5.

Personal Cards.

This unit is a study of cards for personal use. In it the student learns the general sizes and shapes for proper cards for men or women and the character of type to be used on either.

Questions:

What is the shape generally of a man's card?

What kind of type could be used in good taste on card for a doctor?

What is the proper position for the name to be printed on a personal card?

UNIT 6.

Business Cards.

When making layouts for this kind of card the student learns how to balance the matter on a card and to select the kind of type that will harmonize with the character of the card.

Questions:

If a hardware man were to give an order for cards what should the general character of the type be that is used on it?

What is the arrangement of the content of the card when there is a large amount of copy to be set for it?

UNIT 7.

Tickets.

This is a large subject but some of the accepted good forms are studied and copy arranged for them.

Questions:

What are the principal parts of a card that should receive emphasis by means of the type?

If a ticket is to be arranged for a musical concert what should be the character of the border or cut that are used on it?

UNIT 8.

Letterheads, Envelope Corners, Billheads.

It is very often customary to use the same general character of arrangement and type on office stationery. It is good form to have these jobs done with the same style of type and color of paper and ink.

Questions:

If office stationery is ordered for a bank what should be the general character of the type and what quality in business should the printing suggest?

Why would it be poor judgment to set a letterhead for a manufacturer of boilers in shaded Old English type?

UNIT 9.

Labels and Tags.

Package labels admit considerable freedom in design. The printer can express his judgment in this work. The main feature should be its legibility and lack of over decoration. Study of samples of this job gives training in treating the work properly.

Questions:

What kind of a border would be proper to use on a label printed for a florist?

What kind of type should be used on a shipping tag for a hardware store?

UNIT 10.

Dance Orders.

Different specimens of this work are studied and good judgment in the arrangement of the job is secured in this way. Simplicity and legibility are the principal features of an ordinary dance order.

Questions:

When titles of music and names of dances are mentioned in the dance order how should they be arranged?

About how large should a dance order be?

UNIT 11.

Programs.

This job should strive to be easily read. Margins should be ample and if it is a folder program the quality of paper used should be such that it does not rattle when the program is turned.

Questions:

What kind of type is best to use on a program?

Why is it good form to stick to simple type arrangement, few ornaments and good paper stock for a program?

UNIT 12.

Menus.

Menus and programs both should be very easily read. Caps and lower case should be used and strong contrast in color of paper and ink should prevail.

Questions:

If a menu to be used on a Pullman car is to be produced what kind of type should the layout man select?

What is the popular style of arrangement of items on a menu card?

UNIT 13.

Cover Pages.

The diversity of arrangement that may be used on a cover page and still be in good form is very large. It is always good design to be simple in arrangement and not too elaborate. When all of the borders and ornaments that can possibly be put on a cover page are used the result will most likely be a jumble. Study of samples from good printers is the best method to secure good work.

Questions:

What kind of type should be used on a cover page for a furniture catalog?

What general kind of border would go well with a light face gothic type on a cover page?

UNIT 14.

Posters and Placards.

In this job the parts of most importance to the reader are given prominence so that he who runs may be able to read. Attraction and holding power in the poster must be its principal qualities.

Questions:

What help does a border give to a poster?

What is the main thing to be given prominence in a poster?

What effect does proper color combinations have in a poster?

UNIT 15.

Tabular Composition.

In the study and arrangement of tabular work the proper arrangement of figures is learned. When figures are set in columns they should line up at the decimal point. Roman numerals also are arranged in a regular way and the good printer always recognizes good form in this regard.

Questions:

Why is it proper to arrange numbers in columns so the decimal points are in line?

When a fraction is printed with a number where is it placed when set with a column of figures without fractions?

UNIT 16.

Rule Composition.

In as much as rule compositions usually permit of either being set in single or double form, judgment as to the best method can be developed by studying rule forms produced by other printers.

The arrangement of rules and separating materials so as to give best looking job and easiest to lock is studied and determined before the job is begun.

Questions:

What is a double form rule composition?

What is the advantage of a double form rule composition over a single form?

What kind of spacing material is best to use when setting rule forms by hand?

EDUCATIONAL UNITS.

The following units may or may not be given along with the regular or trade work in printing. In the high school where the work is broken up more than it is in a regular vocational school a class period each week is given over to the imparting of information concerning things connected with printing but of a general educational character in regard to printing.

This work is divided into five natural divisions, based on printing equipment: type, presses, ink, paper and rollers.

This work is conducted in talks aided by specimens, materials, pictures and drawings. The purpose of these units is to give the student a larger idea of the printing business so that he will be more intelligent about it.

TYPE UNIT 1.

History and development of the alphabet, type case, writing, wood block printing, and printing.

TYPE UNIT 2.

Men connected with the early development of printing.

Influence of printing on history and education.

TYPE UNIT 3.

Scientific principles of chemistry and physics used in the process of making type and other printing surfaces.

Designing foundry type of different sizes.

TYPE UNIT 4.

History and development of type composing machines, line casting machines, type casting machines.

TYPE UNIT 5.

Making plates for color printing.

TYPE UNIT 6.

Explanation of the following machines and processes: Foundry type, linotype, monotype, electrotype, cerotype, stereotype, nickelotype, aluminotype, zinc etching, engraving.

TYPE UNIT 7.

Explanation of the following machines and processes: Wood engraving, steel engraving, wax engraving, photoengraving, rotogravure, electric typewriter, neostyle, stylograph.

TYPE UNIT 8.

Explanation of the following machines and processes: Multi-color, multigraph, lithograph, intaglio, offset, embossing, embosso, printex process, wall paper.

TYPE UNIT 9.

Explanation of the following machines and processes: Ruling press, color plates, wood block, patent leather, linoleum, stenciling.

TYPE UNIT 10.

Discussion of possibilities as a compositor. Trade practices and union methods explained.

TYPE UNIT 11.

History and development of the printer's stick.

TYPE UNIT 12.

Distribution and care of type and type cases.

PRESS UNIT 1.

Principles of mechanics involved in the operation of presses. The three general classes of presses (diagrammed).

PRESS UNIT 2.

History and development of printing presses and of men connected with the early development of them.

PRESS UNIT 3.

Study of cylinders, web, color, lithgraphic, intaglio, engraving and offset presses.

PRESS UNIT 4.

Hand feeding and automatic feeding of job presses.

PRESS UNIT 5.

Discussion of the development and final stages of the present day newspaper presses.

PRESS UNIT 6.

Study of platen presses, kinds and uses: job, embossing, engraving, cutting and creasing, automatic, hand fed, foot power, hand power, motor driven, Washington hand press, proof press.

PRESS UNIT 7.

Study of cylinder presses, kinds and uses: two revolution, stop-cylinder, automatic, offset, color, newspaper, autopress, Harris, Kelly, pony cylinder.

PRESS UNIT 8.

Study of web presses, kinds and uses: newspaper, job, color, offset, wall-paper, wet ink machine.

PRESS UNIT 9.

Discussion of the parts of a printing press, the frisket, perforating and printing; how to avoid accidents on the press.

PRESS UNIT 10.

Discussion about the possibilities for employment in the trade. Trade condition and the union methods explained.

INK UNIT 1.

History and development of printing ink making. Ink making before printing. Permanency of printing and writing inks. Men connected with the early manufacture of ink.

INK UNIT 2.

Chemistry of derivation of colors for tints, black ink and bases for inks.

INK UNIT 3.

Grinders and mixers for ink making.

INK UNIT 4.

Sources of materials used for colored and black inks. The analine dyes used in ink making.

INK UNIT 5.

Study of dyes, natural colors, dryers, bronzes and reducers.

INK UNIT 6.

Inks for different kinds of work: litho, offset, news, job, engravers. Iron oxide in ink. Transparent and opaque ink. Copying ink and ink dopes.

INK UNIT 7.

The harmonizing of colors by the use of the color wheel.

INK UNIT 8.

Inks for different purposes: bond, halftone, job, doubletone, poster, evaporating and absorbing.

INK UNIT 9.

Mixing colors and bronzing.

INK UNIT 10.

Possibilities for employment in the ink making business.

PAPER UNIT 1.

History and development of printing and writing materials.

PAPER UNIT 2.

Materials used in the manufacture of paper.

PAPER UNIT 3.

Discussion of watermarking, blotting paper, coloring paper, deckle edge paper, machine and hand made papers.

PAPER UNIT 4.

Discussion of other materials used in printing: leather, tin, wood, celluloid, aluminum.

PAPER UNIT 5.

Discussion of paper materials: photographic and blue printing papers; pulp board; fibre board; beaver board; plaster board; linoleum foundation.

PAPER UNIT 6.

Discussion of static electricity in paper and atmospheric condition as they affect paper.

PAPER UNIT 7.

Possibilities for employment in the manufacture and marketing of paper.

ROLLER UNIT 1.

History and development of the roller making processes.

ROLLER UNIT 2.

Composition and methods of manufacture of printers' rollers.

ROLLER UNIT 3.

Chemical and physical properties of substances used in roller composition and how they are affected by the weather.

ROLLER UNIT 4.

Care of rollers. How to protect rollers on a rule form.

ROLLER UNIT 5.

Discussion of the different kinds of rollers: for, distributing, fountain and vibrator; roller bearers; recasting of rollers.

ROLLER UNIT 6.

Possibilities for employment in the roller making business.

THE COLUMBINE CONVENTIONALIZED

C. H. Richert and Otis Philbrick, Rindge Technical High School, Cambridge, Mass.

IT is a far cry from the nodding columbine in the depths of the spring woods to the flat orderly two dimension decoration stenciled onto the border of a curtain or painted on the top of a box.

Just how to, or why, you should follow the trail from the natural flower to the conventionalized shapes are questions that vex the average student mind greatly, but a clear understanding of the process is necessary in any approach to design and its application.

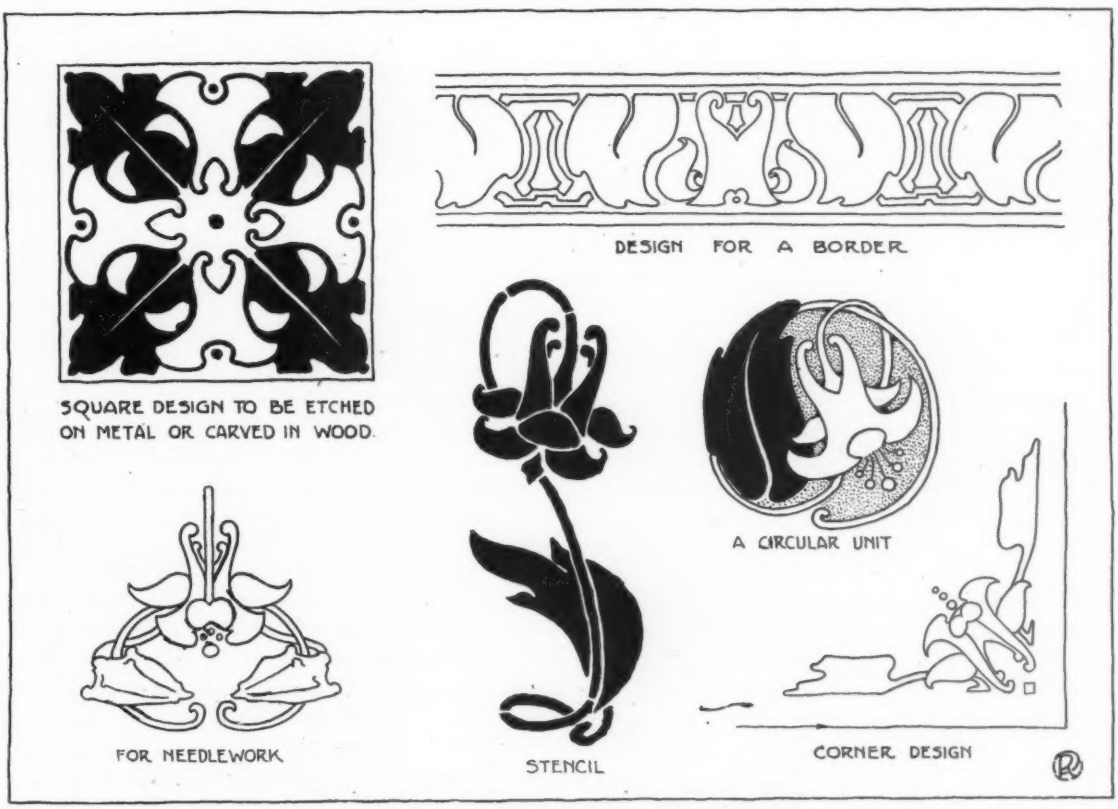
The columbine is a handsome thing in its natural state and the question naturally arises as to why it should not be used as it is. In a large sense it cannot be used as it is—exactly as it is, for, growing it has three dimensions, it has color, it has life and all this against a background of leaves and stems, twigs and rocks. The moment you draw it in outline on a flat piece of paper —no matter how faithfully you copy—you have begun to conventionalize it—the first step has been taken toward making it more suitable for decorative purposes. It might now happen to fit a given space nicely and seem to lend itself to your design without further alteration but, if so, it would be more or less accidental and design should not be accidental. The word design means intention and intention is the opposite of accident.

Most students feel at first that they are going wrong if they make their designs anything else but a direct imitation of nature. It is hard to get them by that point. But when once they do get by, a wonderful and fascinating field is opened up to them.

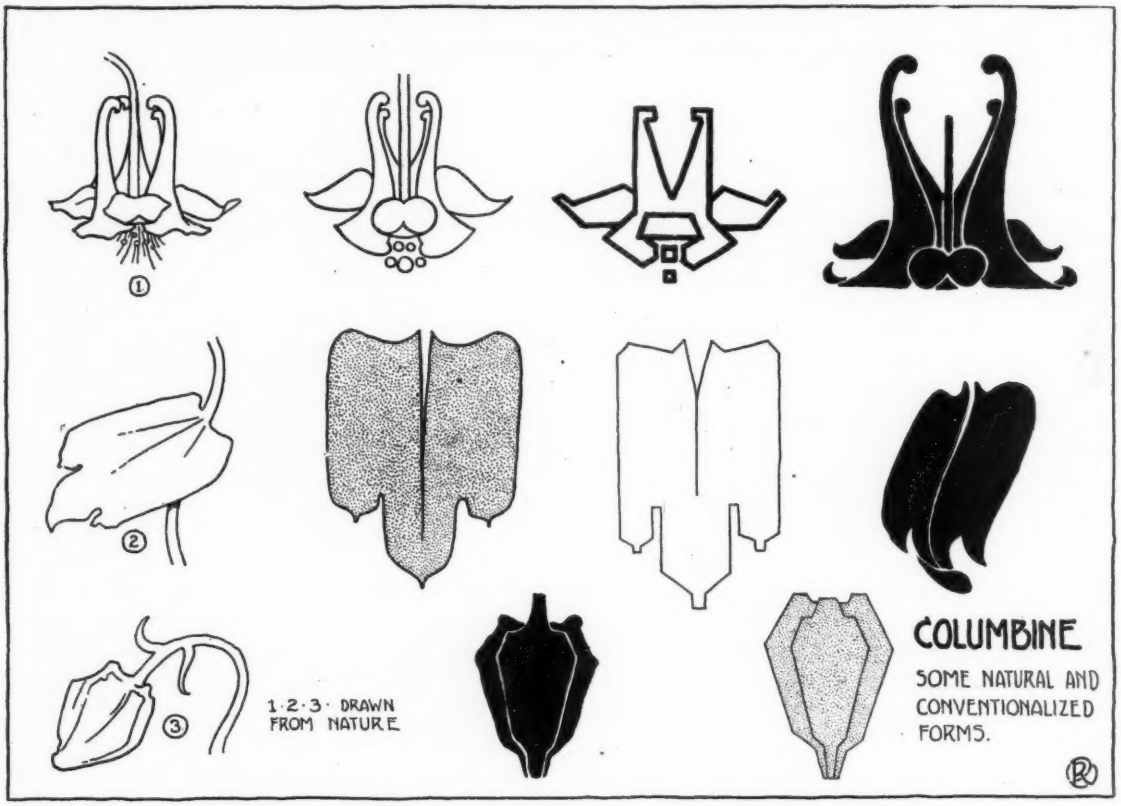
Compare the columbine drawn directly from nature, with the modified shapes made from it at the right. The first one has taken advantage of the curves, they have been made more regular and more suitable for decorating a flat surface. For one thing it will stand repetition better. The next one is made up entirely of straight lines.

It has a husky look and even tends slightly towards the humoresque. The last one is a decorative combination of straight and curved lines. Hundreds more could be made without exhausting the possibilities of the source.

Each of these three shapes radiates the personality of the one who modified them. Three more by someone else would show a different viewpoint and a different personality, so that the natural flower presents an open door into an unlimited field of pleasing shapes and stimulating spaces to those who use it as a theme or motive in this manner, but a closed door to those who only seek to use it as a direct imitation of nature. Mul-



CONVENTIONAL DESIGNS BASED ON THE COLUMBINE.



SUGGESTIONS FOR NATURAL AND CONVENTIONAL FORMS OF THE COLUMBINE.

tiply the possibilities of this one blossom by all the growing forms in Nature and some idea of the broadness of the subject and its inexhaustible source of supply is the result.

Old Mother Nature showed a kindly spirit in furnishing so lavishly with motives for designs and gray matter to employ in making use of them.

The other drawings on the same sheet show the leaf and bud of the columbine conventionalized in the same manner as the blossom.

From the material on this sheet six completed designs have been made and grouped together on the second sheet. These designs may be used for a variety of purposes. The design in a square might be etched in metal for the top of a box or, if done in enamel with leaves of blue green, blossoms of dull orange and a warm gray background it would be attractive. In using the border it might be left in outline or treated with tones and flat colors. Stencils are always usable and practical. The one shown might be used as it is in its nonbilateral form or if traced and drawn about-face either to the right or left of the one shown will form a bilateral unit that would lend itself easily to making batik. The design for needlework would be appropriate for a towel or table mat used singly or repeated upside down below itself to form a diamond. It might also be repeated around the center of a square. The corner design might also be used for needlework, or wood carving. It would also be just the thing for one corner of a hot dish stand—the details of construction of which will be given in a later article.

The columbine as used in these completed designs has been conventionalized and modified extensively. Using natural forms in a slavish imitation of nature is not conducive to good design. This cannot be too constantly reiterated. A large portion of a design's beauty and fitness to purpose depends upon the way in which the natural forms from which it is derived have been conventionalized.

Tracing paper is a great aid in making these conventionalized shapes. Tracing paper is universally regarded as a medium with which to transfer lines from one surface to another, but it has another important use. The Japanese employ it successfully in getting the simplicity of shapes and frugality of line for which their prints are noted. After carrying on a drawing as near to completion as possible, they lay a piece of transparent paper over it and trace, eliminating all lines not necessary to the clearness and beauty of the design. Then over the result another piece of tracing paper is laid and the same process gone thru again, carrying the elimination still farther. This is done over and over, sometimes seven or eight times, until all superfluous lines have been discarded. The result is simplicity in the extreme. Working along this line a piece of tracing paper can be laid over the blossom in the upper left-hand corner of the chart and a variety of different modi-

fied forms will result by simplifying the lines beneath. This will also be found helpful in simplifying the completed designs. They often contain more lines than are needed and without which they would show better taste.

Tracing paper will be found very helpful, also, in correcting students' drawings in the following manner: When a drawing has been brought up for criticism lay a piece of clean tracing paper over it and draw, keeping as much of the student's original as possible, while making a better design. Sometimes a slight change and a great deal of elimination will turn the average design into a really creditable one. The student oftentimes will respond with great interest in watching this and will be encouraged to see the possibilities of his crude design. Only, don't give him the tracing. Keep it, and ten to one in a few minutes he'll be back again to the desk with a request for another look at it. Grant it, for he will really look at it and absorb it more thoroly than if it were handed over to him.

These tracings, if kept, accumulate rapidly. Some of them will deserve enlarging on big sheets to be kept as examples to show the class. No teacher ever had too many such sheets, not only sheets showing finished designs but more especially large sheets of design material, raw material from which designs can be originated, such as the first sheet shown here. This sheet can be easily enlarged for class use.

Actually a great number of these sheets are necessary. Students cannot be expected to carry a fund of this material in their heads. The instructor must supply it in some way. It is as necessary as having a lumber pile in the carpentry shop and like the lumber the natural forms as found in nature must be sawed and planed and sandpapered and stained before it is suitable for decorative purposes indoors. When furniture is made of wood with the bark on it is made for out-of-doors use. Indoors it would be out of place. Refined taste demands somewhat the same of natural forms as used in decorative design. The dog is a conventionalized wolf and is obviously more suitable for man's company than his snarling ancestor.

Record Forms for the Mechanic Arts Department

Used in the Technical Building, Salt Lake City, Utah. G. A. Raeth, Supervisor

THE introduction of the "tool check" was found necessary for the reason that some of the shop instructors had formed the habit of loaning tools to other teachers in the technical building or to teachers of other classrooms, without making a record of the same. The result was that the shop teachers forgot to whom they loaned tools, and the ones doing the borrowing would forget to return them. The loss of tools from this cause became serious and the use of the "tool check" was of necessity introduced.

The "tool check" calls for the date on which a tool is borrowed; the name of the instructor from whom the tool is borrowed; the name of the tool borrowed; and the name of the individual doing the borrowing. Upon return of the tool, the date is recorded and the signature of the instructor from whom the tool was borrowed and finally returned, is affixed.

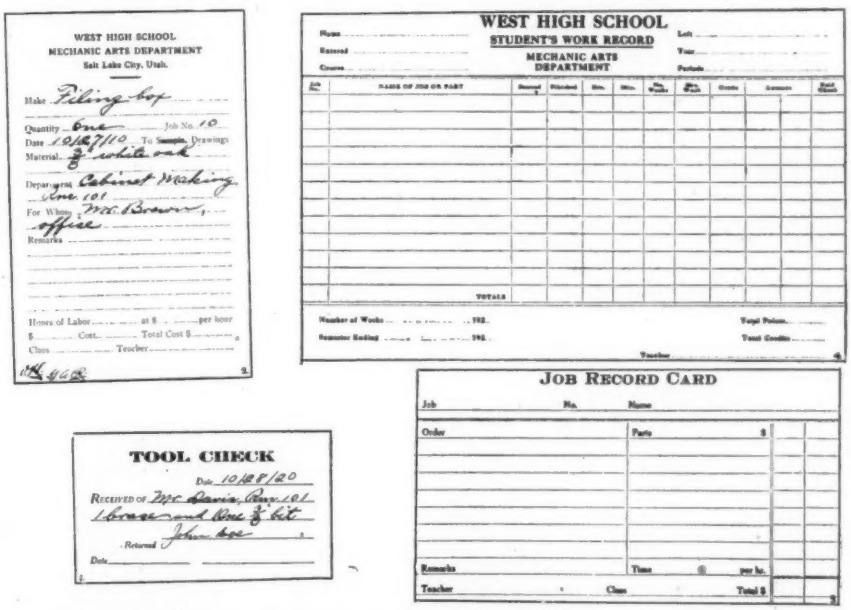


FIG. 1.—FORM FOR TOOL CHECK. FIG. 2.—WORK ORDER. FIG. 3.—JOB RECORD CARD. FIG. 4.—STUDENT'S WORK RECORD.

It often happens that it is necessary to make repairs in another shop, to have a piece of work done for some other classroom or teacher. This was often done without good reason or the necessity for such a job. There was no record kept of such work, the kind and amount of material used, and of its relative value. This resulted in a careless use of materials and the making of things that were entirely unnecessary. All such orders are now made out in the office of the technical building by the supervisor in charge. These work orders are made in duplicate, one copy of which is kept in the office and the second is given to the teacher whose class is to do the particular job called for. Thus no piece of work may be done in any classroom or shop without an order from the supervisor's office. See Fig. 2.

The "job record card" is used in the automobile mechanics classes. These forms contain detailed information on repairs done on cars for individuals who bring them to our automobile shop classes. These record cards come in triplicate. One is sent to the office, another is given to the owner of the car and the third copy is kept on file by the class teacher. See Fig. 3.

The use of the "students' work record" (Fig. 4) contains a detailed record of the work done by a student during a certain period of weeks or a semester. These records are kept by the students themselves with the assistance of the teacher in charge. The same are made out in duplicate; one copy is kept by the class teacher and the second is turned in to the office. The "student's work record" sheets are handy reference of all work done by individual students.

The instructors of the mechanic-arts department were asked to make a short report of the work done in their classrooms each month and also of the collections made. It developed that such a thing had not been done before and some of the instructors were at a loss just how such reports were to be made. For their convenience forms as shown in Fig. 5 and Fig. 6 were mimeographed.

COLLECTIONS

Month Ending_____

Teacher_____

Class Per.	For What	Amount Collected	From other sources or individuals	Amount Collected

FIG. 6. RECORD OF COLLECTIONS.

MECHANICS ARTS REPORT

Month Ending_____

Teacher_____

Periods	Subject	Class	No. enrolled	Individual problems done or made	Things done for other classrooms or the school or others	Value

FIG. 5. TEACHER'S REPORT OF WORK DONE BY STUDENTS.

Administrators have always recognized the value of keeping records of some sort. They give ready and definite information of things of vital importance to their department; they promote thrift and co-operation and are a means whereby systematic reports may be made to the superintendent's office or school board.

UTAH'S PART-TIME LAW OF 1919

Francis W. Kirkham, State Director of Vocational Education

"At the last session of its Legislature the State of Utah inaugurated what I regard as a model compulsory part-time education law. Under the wise leadership of its State Department, and with the cooperation of the schoolmen of the state, the bare text of this law has been made into a comprehensive program for the conservation of children not equaled on this continent. In this way Utah has not only taken a foremost place in the galaxy of states but has made a distinct and lasting contribution to citizenship, efficiency, prosperity and civilization."—Dr. C. A. Prosser, director, the William Hood Dunwoody Industrial Institute, Minneapolis, Minn., formerly federal director for vocational education.

"Utah is the only state that has attempted to eliminate idleness from twelve to eighteen thru the public school system. No other state is within hailing distance of Utah in an efficient attempt to solve the civic, industrial and educational problems from 12 to 18."—Dr. A. E. Winship, editor Journal of Education, Boston, Mass.

The Utah Educational Law of 1919, referred to in the above quotations, is unique in two features. First, it requires all children to 18 years to attend a public or private school for thirty weeks, with this exception, that pupils who have finished the eighth grade or who have reached 16 years of age may be excused by the district or city superintendent to enter employment provided they attend a part-time school at least 144 hours. Second, it provides for year-round educational training in health, vocations, and civic and patriotic service.

Just what does this new law mean and how does it work in reference to its first provision?

First, the law clearly aims to eliminate idleness by requiring the pupil to be either at school or at work and for this purpose every child in Utah is required to register once a year with school officials. This registration is closely checked with the annual school census. Second, the law directs the attention of educators to the

necessity of making the working time an educational time for the pupil. Otherwise, the boys at work will not receive a square deal in educational opportunities or in the expenditure of public educational funds.

The first noted result came in the very large increase in the enrollment of boys and girls in the regular junior and senior high schools, amounting to 40 per cent increase for all the high schools of the state in the first year. These boys and girls who had already entered employment decided to go to school all the time as they had to attend school part of the time. Moreover, the law popularized education, for everybody went to school and loafing by minors under eighteen on the public streets automatically ceased. The second outstanding result was the demand which these young people made upon the schools. Clearly, this group of young people needed educational opportunities and facilities to prepare them to more efficiently meet the immediate problems of their lives—mainly vocational education and training for good citizenship.

Courses in English, science and mathematics designed primarily to prepare for the professions or for entrance requirements to college were not selected. School boards were therefore obliged to provide for increased facilities in farm mechanics, in agriculture, and in other vocational courses and more practical and less technical courses in English and mathematics. Opportunities in recreation and clean sport were called for and where these demands were met by principals of high schools, the high school became the great popular social center of the community. Glorify to his companions one thing in which a boy excels and he will devote himself to other things which you offer for his advancement.

The misgivings and apprehensions of school administrators in the difficulties they expected did not materialize except in a limited degree. For example, smaller high schools in the more sparsely settled districts provided for the increased attendance in regular classes with but small, if any, additional expense. A very considerable portion of the farm boys attended school for from four to six months. Courses in agriculture and community civics were adjusted to care for these pupils by teaching the subject matter in units. Also, high schools organized their courses on the four-quarter system. A very few boys and girls in these smaller towns entered regular classes for part-time. Provo is a city of eight thousand people and yet the records for this year show there are only 61 part-time pupils, and generally they attend a regular school class.

A careful study is being made this year of attendance in which the following items are being reported upon by the school districts: Enrollment in grade schools, junior high schools, senior high schools, part-time pupils in regular schools, special part-time classes, and short-unit courses. This enrollment is checked with the annual census and pupils moving into the district and out of the district are accounted for.

Tabulation is also being made for the different forms of excuses permitted under the law. Reports have been received at the state office for about one-third of the districts. On an average about three per cent of the school census is unaccounted for. The enrollment in the high school continues to increase very materially this year. In some cases the growth is phenomenal. For example, two years ago the South Cache high school enrolled 125 pupils; this year it has enrolled 350. The Jordan school district has doubled its enrollment from 350 to 700 in two years. The writer was told recently that in the Nebo district in the high school of a city containing about 3,500 that 200 pupils will enter high school next year with a graduating class this year of 28.

In general, about fifteen to seventeen per cent of the entire school population in Utah attend high school. The twelve districts reporting show a total of 36,492 school census, 23,808 attend grade school; 5,707, junior high schools; 3,202, senior high schools; 2,214 other schools in the district, namely, private schools; 414 attend schools out of the district; or a total of 35,345 attending full time schools. Two hundred and sixty-eight attend regular school for part time; 380 attend special part-time classes; 76 attend short unit courses; or a total of 724 attending part-time schools; or a total of 36,069 attending full-time and part-time schools. In this same group there are 328 who have reached eighteen years since August 1st; 52 have married; 153 are excused on account of illness, and 151 live beyond a 2½ mile school limit where no transportation is furnished, and 143 are excused for other purposes. These figures added to the number of those moved into the district and moved out of the district leave from one to three per cent only of the school population unaccounted for.

The citizens and the school people of the state believe in our new laws and are determined upon their administration. Much is yet to be accomplished. At the Utah State Fair in a special exhibit which occupied a large room the following slogan was displayed: "Utah's educational program provides year-round training in health, citizenship, vocations, arts and recreation, emphasizes knowing and doing, instruction and achievement."

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

NO PLACE FOR ANTAGONISM.

COMPLAINTS are already coming in from teachers to the effect that some administrative officers—supervisors, principals, or superintendents—have assumed an attitude of hostility toward them with the evident purpose of getting rid of them.

This is a strange indictment. We wonder if there are such people in responsible positions. We wonder also if people in such responsible positions are not frequently under great provocation. There are usually two sides to such controversies.

But why should there be personal controversies in purely professional matters? Very few people are able to do their work with absolute perfection, especially from the standpoint of the expert overseer. But this is not an occasion for hostility; it's an occasion for kindly and effective criticism. Such criticism should be freely offered by supervisory officials, and just as freely and kindly received by the teachers. There would seem to be no occasion for personal bitterness in such a proceeding, if both sides are actuated by the right motives.

If a teacher fails in his work it is the duty as well as the privilege of the supervisor or administrator to render every possible assistance in the way of advice, criticism, and suggestion, in helping such teacher to overcome his difficulties and to retrieve himself from his failures. There are supervisors who proudly relate how they have helped a failing or mediocre teacher to become a superior one.

But assuming the failure to be complete and irretrievable, there is yet no occasion for hostility or unhappy personal relations. A supervisor usually tells a failing teacher with kindness and with reluctance that he is failing and that it seems advisable to let him go at the end of the year. No fair-minded teacher should resent this. He should recognize it as the supervisor's duty.

The proper thing to do in all such matters is to deal always on a professional basis, to recognize the rights of all concerned, to deal justly with all interests involved, and to leave as far as possible all personal feelings and considerations out of the decisions which justice demands.

STILL OPPORTUNITIES IN TEACHING.

AFTER the great agitation concerning the inadequacy of teachers' salaries (the methods of which were not always wise nor the results desirable), the teacher's business has steadily gained both in standard and in desirability.

Even the salary question has changed very materially. The medium salaries for both men and women in standard high schools in Illinois have increased over $400 the last year. This increase will probably be equaled or exceeded in many other states. The readjustments in matters of taxation, salary schedules, etc., have merely begun. The next few years should witness a striking growth of the spirit of liberality, or at least of justice, toward the teachers.

Even at the present time, young men with two years of preparation above high school in the field of industrial arts can secure teaching positions that equal or exceed even in point of salary any other work which they can enter.

Besides the salary inducement, there are many other attractive considerations in connection with the teacher's work. Especially in the field of industrial education there are developing many avenues to desirable employment both in and out of the school. Proper training in this field puts one on the eligible list for entrance into these desirable lines of work.

While we are discussing vocational guidance, is it not fair that promising young men just graduating from high school should be informed concerning the opportunities for service and success in this particular field of educational work? The criticisms of the teacher's tasks and opportunities have been grossly overdone. Is it not time now to emphasize the other side and to call for recruits among competent young men?

INDUSTRIAL ARTS AND THE PART-TIME SCHOOL.

SOME manual or industrial arts teachers are still disturbed by the fear that in some way vocational work and the part-time school endanger their work.

So far as vocational education is concerned, it deals with a different group and in a different manner from the group and manner with which industrial arts are concerned.

The shop work in the general continuation courses of the part-time school is nothing more or less than a good grade of the right kind of manual or industrial arts. When properly handled, such work may become the very center of interest in the part-time continuation work.

Instead of feeling discouraged over the outlook, the manual or industrial arts teacher is now in a position to render an indispensable service to the part-time continuation school. If he is properly prepared (and such preparation presupposes some trade experience), such a teacher will find abundant opportunities both in the part-time and the junior high school for interesting work and steady advancement. If he has not had actual contact with trade work, he should lose no time in getting it. Evenings, Saturdays, and summers may very profitably be spent in gaining experience in the industrial shops.

There is more encouragement now for the manual and industrial teachers than ever before, and they should prepare themselves to take full advantage of it.

UNCOVERING TALENT

The School Art League of New York is doing admirable work in discovering and developing the artistic talents of gifted pupils from the high schools of the city.

Guidance of artistic talent is a more responsible undertaking than guidance in vocational work that requires mechanical skill. Indeed the more one becomes interested in artistic performance and in artistic products, the less confidence he may have in his judgment of artistic talent. Art applies to such a variety of effects and purposes that no one person can presume to judge them all, without realizing that his standards are either arbitrary or uncertain.

Marked ability in drawing, modeling or painting does not indicate more than technical skill. Each effort in artistic performance is an experiment the result of which may not be determined at once and finally. So art becomes the most difficult element in human production to pass judgment on and to become sponsor for.

We recall the assertion of one teacher of design: "The worst I can say of your design is that it is commonplace."

We must agree with the assertion that Art is never commonplace.

We also agree that Art expresses emotion and creates emotion in those who see it. Art is beautiful.

With evidence of ability to produce exceptional and beautiful results in design the teacher may well encourage a high school pupil by every means possible to bring his talents to bear on some definite problems in design. Here again the teacher must be decisive but not altogether arbitrary. Every artist is successful in a certain limited field because his interests and emotions lie within a limited range of human activity. Each student will be successful in design according to his interest and emotional response to the problem with which he works. The high school student is not established in taste however and should be constantly subjected to new experiences.

Unlike the professional artist who has accumulated definite material and acquired definite understanding, the youth has much to learn and unlearn. We doubt the judgment of bringing the artistic bent of a high school pupil to bear on one narrow line of production to the neglect of study that will develop the whole conception.

The guidance of artistic talent must not be made purely vocational guidance. Talent must be uncovered that it may grow and be developed by careful nourishment.

THE OLD TEACHER

There are times of reaction in the lives of conscientious servants of humanity when they feel that years of service have been rendered in vain. After all, what is the use of this continuous daily grind of classroom, shop or office when so little direct results are in evidence! Then comes a rift in the clouds of despair that sets the heart aright. A breath of fresh encouragement is taken which fills the lungs with vigor, and the ambitious energy of the teacher is regained.

Fortunately these reviving experiences come to the old teacher and are so convincing that they cannot be denied. The old teacher meets for the first time in years one of his pupils who went out so apparently weak in the essentials of successful living, and finds him strong and successful. Surely, thinks the old teacher, this is no work of mine; this fellow has succeeded in spite of my instruction. But as he observes the nature of this success it is evident that it is supported by the conceptions and ideals of the classroom. This job must be done right for the sake of right doing. It must be done by me with as little direct help as possible. It is not of great immediate value but is part of a great purpose to succeed. It is *the job at hand,* and that is purpose enough.

When the teacher recalls that this one precept of doing the thing at hand in the best possible way has always been emphasized to his classes, he may take upon himself some credit for successful accomplishment on the part of his pupils. The greatest project ever conceived by a teacher and the most essential one is the building of a strong, reliant character. The school subject is incidental.

THE PROJECT IDEA AND THE INDUSTRIAL ARTS.

The most prominent and important movement now in elementary and some phases of secondary education is the attempt to work out a satisfactory curriculum on the project basis. The Project very clearly holds the center of the stage. It would seem to be a necessary part of any satisfactory solution of the course of study and curriculum problem.

When one comes to think about it, manual training, industrial arts, and vocational work are the really genuine, original, and perfectly consistent project subjects. They set a real, purposive task to be accomplished. In the accomplishing of the task, various and sundry pieces of information, questions for investigation, methods of procedure, and problems of drawing and computation arise as a necessary part of the work. This is the very essence of the project idea so widely exploited now by educators in various fields of work.

It is interesting to note that the manual training teacher of twenty-five years ago used in a limited way the project idea and even had some conception of the bigger notion as it is now conceived. So the world do move, after all, but we are rather disposed to think that at least in some ways the unassuming worker in the school shop has been riding in the van of the movement.

There is still much to be done to perfect the work of the industrial arts on the lines of the broadly conceived project idea. But in this direction lies the road to richer and fuller significance for the work.

Vocational and Educational Guidance in Erie, Pa.

The Work of Mr. H. E. Stone, Boys' Counsellor.

Vocational guidance has become an integral part of the instruction offered in the Central High School at Erie, Pa., and the work, which was initiated a year ago, has been considerably broadened during the present scholastic year. The department is in charge of Mr. H. E. Stone. In a recent discussion of his work, Mr. Stone writes:

"The idea of vocational and educational assistance to young people appeals to all thinking men and women. A large proportion of Erie boys and girls leave school for work as soon as the law allows. They have talents which need to be conserved.

"More than two thousand occupations are bidding for their service. Shall they go out into the world without guidance to add to the number of misfits who will some day seek to "get even" with society for its neglect? Or shall they be given information about themselves and the world in which they are to live and work, about occupations and opportunities for advancement, thru home study, night schools, correspondence courses, etc.?

"Shall they be led to think in terms of their own abilities, interests and aptitudes? Or shall they be shoved ruthlessly into blind-alley jobs by an educational system too long forgetful of the right of every child in a democracy to equality of educational opportunity?

"Hundreds of cities, including Erie, have at last recognized the responsibility of the schools in preventing at least some failures in life, thru occupational and educational counsel that will reduce the number of misfits.

"And what of those who enter and will complete the senior high school? Is it not important that they enter the right school and pursue the right courses of study impelled by an interest born of the 'life career motive'?

"English is the only required subject in most senior high schools today, and wisely so. The preparation needed by future doctors, salesmen, electrical engineers and machinists differs widely. Furthermore, each student has his own distinctive qualities and abilities. It is fortunate, therefore, that each student in the high schools will have special help in adjusting himself to the right course of study and to the right life aims.

"There was a time when the high school enrollment in Erie was small and the free elective system did not exist. The need for scientific, vocational and educational guidance was not then so great.

"Today the situation is quite different. Our high schools are democratic. They are being adjusted to meet the needs of all the children of all the people. They are acknowledging their obligation to recognize the vast individual differences that exist among secondary school pupils.

"The high school principal who once gave time to the educational guidance of the talented few finds himself confronted with new problems. He lacks both the time and the special training needed for scientific guidance of boys and girls on occupational questions. If successful in improving the quality of instruction in his school, he finds himself busy with problems of supervision. For this reason the principal of broad educational vision welcomes the trained counsellor. He is fully cognizant of the fact that successful guidance depends on close contact with schools, parents, teachers, pupils, employers, business and the multitude of possible occupations. All this calls for the specialist to whom fathers and mothers may turn often for advice and help concerning their children's future."

Aims of the Vocation Bureau.

The immediate aims of Mr. Stone's work as outlined by him are:

1. To maintain a clearing house for facts on life careers.
2. To publish occupational facts for the guidance and help of pupils and their parents.
3. To develop closer co-operation between schools and occupations.
4. To assist the young people of Erie in choosing, preparing for and advancing in an intelligently chosen life work.
5. To study into and assist in the prevention of waste in the preparation of our boys and girls for their life careers.

Facts for Prospective Sheet Metal Workers.

In furthering the second purpose of the bureau, Mr. Stone has published a number of outlines on several trades and occupations. The following facts for prospective sheet metal workers is a typical outline which has been prepared and placed in the hands of each boy:

1. The age of effective entrance into the sheet metal trade is from 16 to 19 years.
2. Formal apprenticeship does not exist in the sheet metal trade.
3. Most shops arrange the work so that sheet metal workers will work both in the shop and out on jobs.
4. The work of the sheet metal trade is not so monotonous as that in some trades because of the variety of the work done.
5. Workers in the sheet metal trade work an eight-hour day, with time and a half for overtime and double pay for Sunday work.
6. Sheet metal workers who can do expert work make from 80 to 95 cents per hour (1920). Helpers begin at from 30 to 40 cents per hour (1920), their pay increasing while they are learning until the maximum wage is reached.
7. The sheet metal trade can be learned in from two to three years.
8. Sheet metal workers work in copper, sheet iron, tin, galvanized iron and in all sheet metals.
9. Sheet metal workers put on metal ceilings and tin roofs, they hang cornices and gutters. They make cylinder jackets, crank shields, guards for machinery, bread pans, cake pans, etc.
10. Sheet metal workers need to do much figuring. A good knowledge of arithmetic is therefore esential. They must be able to read blueprints and to lay out work if they hope to be promoted.
11. Many sheet metal workers read and study at night, thereby becoming more proficient in the trade and in some instances advancing to foremen. More than forty sheet metal students have recently taken the free night school courses in sheet metal drafting and design.
12. The National Correspondence School of St. Louis offers a correspondence course that has been taken and recommended by some Erie sheet metal workers.
13. Erie sheet metal foremen report that there is a shortage in this trade (1920). They express surprise that more young men do not enter it.
14. Erie sheet metal concerns prefer young men who have taken the sheet metal trade course offered in the schools.
15. If you are interested in the sheet metal trade, why not talk it over with some sheet metal workers, visit some of Erie's sheet metal concerns and then consult the boys' counselor with a view to taking the trade course?

Facts for Prospective Electrical Workers.

The following are facts for prospective electrical workers:

1. The electrical trades include:
   a. The manufacture and repair of electrical equipment such as generators, motors, telephones and switchboards.

JOB ANALYSIS CLASS, BANGOR, ME.

Front Row (Left to Right): A. B. Hayes, Director of Mechanic Arts; Miss Theresa Pietto, Miss Ethel E. Harrigan, Director of Domestic Science; Miss Ruth Crosby, Mr. Otis H. Ginn.
Second Row: T. C. Morrill, Superintendent of Schools; E. K. Jenkins, State Supervisor; C. A. Noyes, P. M. Williams, C. E. Holyoke, Leyland Whipple.
This class has been organized thru the cooperation of Director A. O. Thomas, State Superintendent of Schools, and Superintendent T. C. Morrill of Bangor. It is conducted by Mr. E. K. Jenkins, State Supervisor of Trades and Industries for the State of Maine.
The course aims to give teachers a working knowledge for analyzing jobs and for organizing the material so that students in vocational courses may receive a maximum amount of information in the minimum amount of time.

b. The installation of wiring systems for lighting, heating, power communication and signals.

c. Outside wiring for the transmission of power street lighting, etc.

d. Power station maintenance and operation.

2. The manufacture of electrical equipment includes many highly specialized occupations of which armature winding may be taken as an example.

3. Those interested in the manufacturing of electrical equipment will do well to visit the plant of some great electric company before deciding to specialize in electricity.

4. The boy who chooses inside wiring as an occupation must learn the various methods of installing electric wires and conduits. He will need also considerable specialized knowledge of the theory of electricity and a working knowledge of the electrical code governing the installation of wires in buildings to be insured against fire.

5. To be a success as an inside wireman one must have some skill in the use of the hands. Soldering torch, brace and bits, screw driver, connectors and pliers must all be used in the installation of wiring systems. The hand skill required is not as great as in the toolmaker and pattern maker trades.

6. The work of the inside wireman is one of the most healthful of the building trades. There is no heavy lifting, no dangerous machinery, etc.

7. While the work of the inside wireman is not dangerous, that of the outside wireman is highly hazardous. High voltage transmission lines demand extreme care on the part of the worker.

8. The working day of the inside wireman is generally eight hours.

9. Electrical workers in factories generally work nine or ten hours per day.

10. An electrician needs some practical mathematics. He ought also to study electricity and magnetism, mechanical drawing, architectural drawing, etc.

11. Both practice and theory are necessary for success in electrical work.

12. Some electricians and many electrical companies run supply and fixture stores along with the practice of their trade.

13. Electrical contracting, the selling of electrical fixtures and work as a practical electrician are possible opportunities open to those who have learned the electrician's trade. The electrical designer and the sales engineer need higher and more technical education.

14. There are few apprentices in the electrical trade. Boys begin as helpers. In the great electrical companies, however, contract apprenticeship courses are offered to young men who are ambitious to become electrical engineers or high grade workers in the plant.

15. Why not learn much about many occupations before choosing your life work?

16. A two-year unit trade course for electricians is maintained at Academy High School.

17. The entrance requirements to the two-year unit trade course for electricians at Academy High School are: Fourteen years or more of age and ability to profit by the instruction offered.

18. Those who complete the two-year unit trade course for electricians at Academy High School may be admitted to the senior high school. This is necessary if preparation for the engineering department of a university is desired.

A POINT IN TEACHING MANUAL TRAINING.

To the Editors:

In the shop organization, details such as preparing materials, etc., seem to so monopolize the time of the average teacher that he has time to consider only his finished product. Or perhaps he feels that he must put his time on this phase of the work in order to have something to show the public for the money it has put into shop equipment.

In some cases, however, he is not getting what he is working so hard for, because he is overlooking some very important points. I have met many men, for instance, who are having difficulty in putting over their work in the beginning sixth grade. In a great many cases, they are starting work with the jack plane at this time—starting with a small project, but with one which requires formal work in planing to a line and squaring stock. In my estimation, the men whom I have met are falling down on this point. They are not making an analysis of the job before starting work. They have not clearly in their own minds the several detailed operations involved in the big job. How can they expect to impart that which they do not possess? Would it not be better, if there are too many details involved in the job, to pick it apart and put across a few at a time? For instance—with the jack plane—you have the handling (actual movements on wood) of the plane, which is in itself a job, the adjustment of the plane and the formal work of planing to a line and squaring stock. I have the boys first use the plane on a model where they plane to a line, but do not have to actually square up—that is in an informal way.

This gives them the handling and adjustments. That is as much as the average boy can master at one time. Then I follow up with the formal work, actually squaring stock. It seems to me that I get much better results this way.

Would it not be better for us to put a little more time on analysis of the job and thought processes involved in the job and not worry so much about that "finished product"?—*James E. Hopkins*, Supervisor of Industrial Arts, Columbia High School, South Orange, N. J.

THE MANUAL ARTS CONFERENCE.

The conference of specialists in teacher-training, called annually by the Commissioner of Education, met in Indianapolis December 9, 10, 11. As usual, thirty-five or forty men from all parts of the country were present, with an occasional influx from the Indianapolis schools on invitation to hear certain discussions.

Dr. Wm. T. Bawden presided in his annual and usual manner. The program was unusually strong and varied, the distinct emphasis being on the matter of distinct objectives in the various phases of manual and vocational education, the clarifying of certain relations, and the possibilities of standardization and tests of the completeness of the work accomplished.

Among the great mass of excellent material presented, it probably would be fair to point out the contributions made by J. C. Wright of the Federal Board; DeWitte S. Morgan, Indiana University; G. E. Meyers, University of Michigan; R. W. Selvidge, University of Missouri; Ira S. Griffith, University of Wisconsin; Edwin A. Lee, University of Indiana, and D. J. McDonald, University of Cincinnati. Quite equal in importance were the summaries presented by Prof. Chas. A. Bennett, George F. Buxton, and E. L. Usry.

The whole Conference was voted a most enjoyable and valuable meeting. Having tied between Bradley Institute and Michigan University as to the meeting place for next year, the Conference instructed Dr. Bawden to use his discretion in the selection.

THE ILLINOIS MANUAL ARTS ASSOCIATION.

For the first time since the war, the Illinois Manual Arts Association had a kind of get-together meeting at Springfield, December 30. The purpose of the meeting was to decide what the future of the organization should be. It was voted unanimously to revive the Association and to take up the tasks where they were dropped when the war came and took some of the leading members and officials into the service.

This particular meeting was planned chiefly by the former president, L. A. Tuggle of Danville, and Heman J. Barber of Chicago. It was a great success and holds forth the hope that this organization may be as useful in the next twenty years as it has been in the past twenty.

The following program was carried out as planned:

"The Manual Training Teacher—a Professional," A. M. Mercker, Supervisor Manual Training, Quincy, Discussion led by Lewis C. Robey, Principal Morrisonville Community High School.

"Need and Method of Teaching Freehand Drawing in Manual Arts Work," A. B. McCall, Mechanical Drawing Instructor, Springfield.

"Part-Time Schools for Children in Employment," E. A. Wreidt, State Supervisor of Industrial Education, Illinois.

"Continuation Work and Its Relation to Manual Arts," Professor S. J. Vaughn, University of Illinois.

"The Aim of Manual Arts Instruction for Boys of the Junior High School," Charles A. Bennett, Editor "Manual Training Magazine," Peoria.

"The Lesson Plan," Albert F. Seipert, Dean Teachers' Training Course, Bradley Polytechnic Institute, Peoria. Discussion led by L. B. Echols, Quincy High School.

"Class Teaching and Individual Teaching in the Manual Arts," A. C. Newell, Director Manual Arts, Illinois State Normal University, Normal.

"Vocational Rehabilitation of Disabled Soldiers," L. W. Wahlstrom, Federal Board of Vocational Training, Chicago.

The officers for next year are: President, A. F. Siepert, Peoria; Vice-President, A. B. McCall, Springfield; Secretary-Treasurer, A. M. Merker, Quincy.

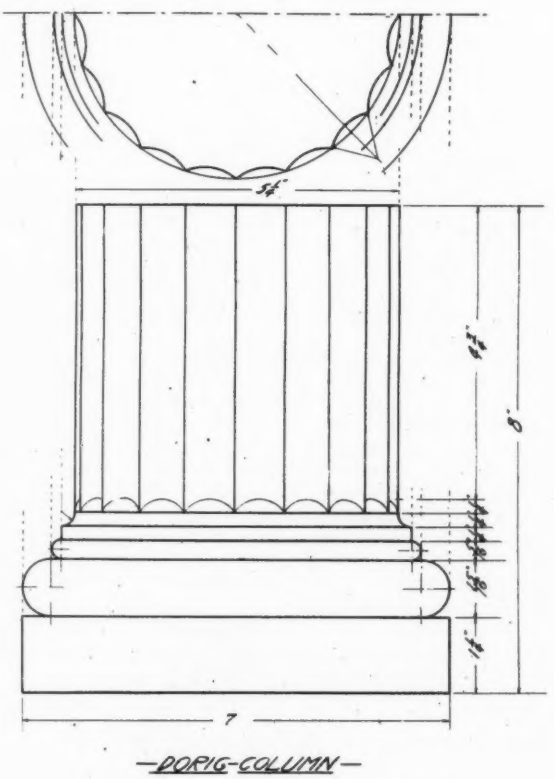


FIG. 2. DETAILS OF BOOK ENDS. SEE NEXT PAGE.

TWO PROBLEMS IN WOOD-TURNING

Herman Hjorth, Director of Technical Work, Baldorioty de Castro Graded and Technical School, San Juan, Porto Rico

THE two problems in wood-turning here are somewhat out of the ordinary and suitable only for older boys having had some experience with the lathe.

The two half columns of the Doric Order, shown in the photograph, Fig. 1, were made in the following manner: Two blocks of wood (in this case mahogany) were cut so that each was a little wider than the largest diameter of the column, a little thicker than the largest radius, and about 6″ longer than the total height of the column. One face on each block was smoothed and tried with the other block until perfectly true. They were then bolted together thru the three inches left over on each end. Four ¼″ bolts were used, the nuts screwed up very tightly, and the projecting ends of the bolts sawed off flush with the nuts. The turning was done in the usual manner, after which the flutes were laid out, Fig. 2, and carved by hand. They were colored with bichromate of potash and French polished.

FIG. 1. COLUMNS FOR BOOK ENDS.

The urn-shaped object shown in the second photograph, Fig. 3, is a knife box of a kind used about 130 years ago. These knife boxes, designed to hold knives, forks and spoons, were used by our forefathers as an ornament on their sideboards, and were often made in pairs, one on each end of the sideboard. This particular knife box, as will be seen from the drawings, Figs. 4 and 5, is designed to hold twelve knives and twelve forks. With regard to the turning it is sug-

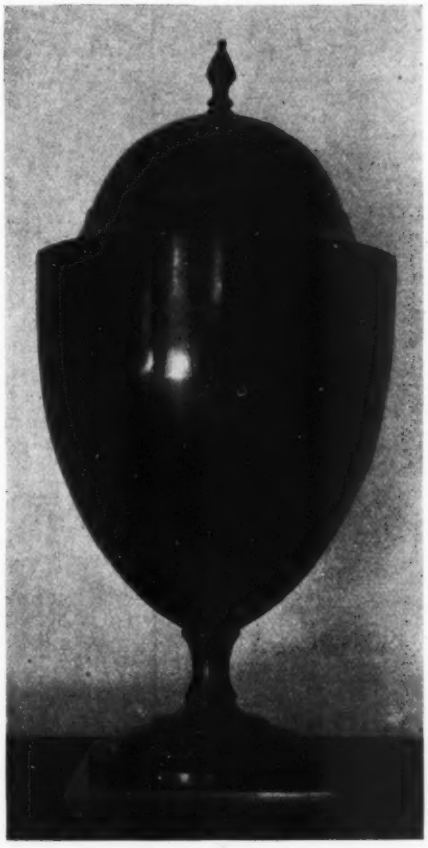


FIG. 3. KNIFE BOX.

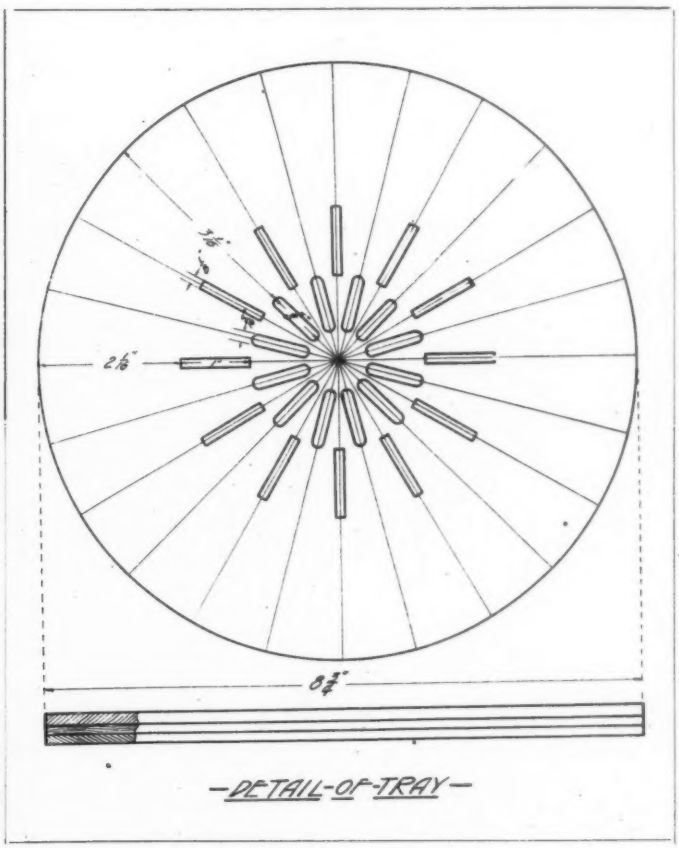


FIG. 4. DETAILS OF TRAY FOR KNIFE BOX.

gested to use the dead center to help steadying the work on account of its weight, and not depend on the face plate alone. When the lower part of this urn was turned, it was gouged out first in order to lighten

in a similar manner, after which the two were fitted together, smoothed off and polished, the lower part remaining screwed to the face plate and the center of the lid being held by the dead center. Templates

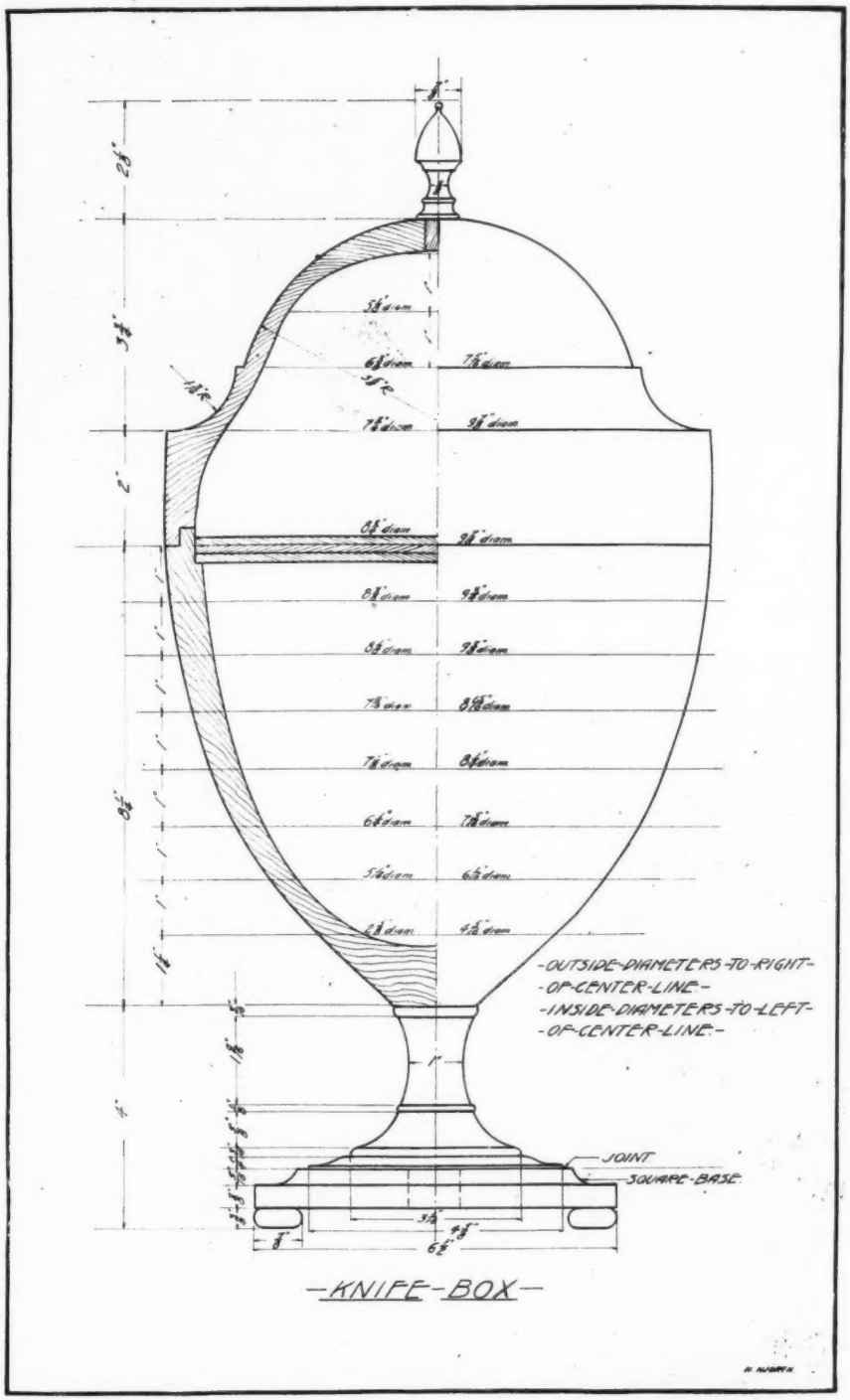


FIG. 6. DETAILS OF KNIFE BOX.

it, leaving a core by which it could be supported by the dead center. The outside was then cut down to size and the core finally cut away. The lid was turned

were used in order to get the exact shape. The tray for the knives and forks, Fig. 4, was made of three-ply wood and fitted tightly in place.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

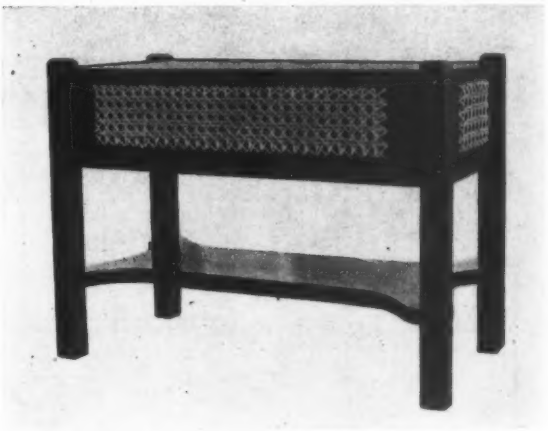
A FERN BOX.

L. M. Klinefelter, Norfolk, Va.

The fern box is an interesting and not especially difficult piece of small furniture to make. It also gives an opportunity to combine caning and sheet metal work with woodwork. The shelf shown may be omitted, but if this is done, particular care should be taken in selecting straight material for sides and ends, so as to avoid a twisted box.

All inside surfaces should be given a protective coat of shellac and the finish in general should be waterproof.

The metal container should be of heavy gauge galvanized iron, slightly smaller than the inside of the box, with soldered seams and a quarter-inch rim around the top. The rim stiffens the container and supports it on the strips run around the top of the box.



THE FERN BOX AS MADE IN THE AUTHOR'S CLASS.

MAKING FLOOR LAMPS ON A SMALL MANUAL TRAINING LATHE.

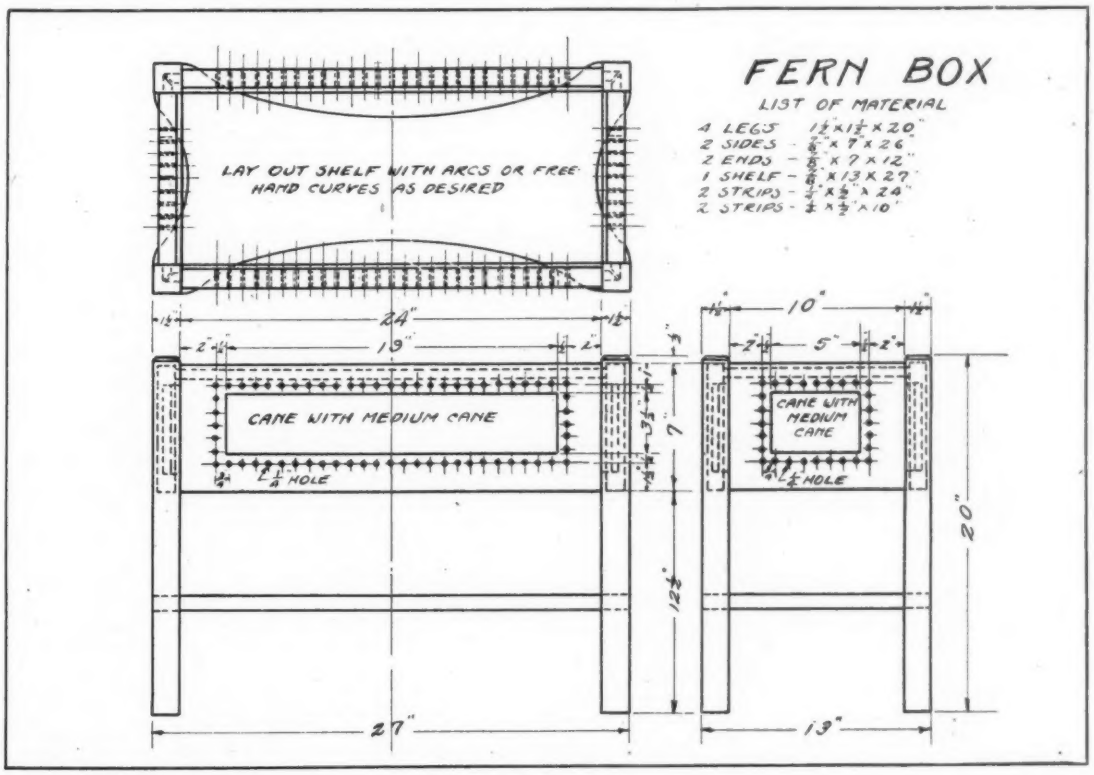
F. J. Phelan, Manual Training Instructor, Collegiate Institute, Galt.

For the benefit of manual training schools that are equipped with small lathes, holding work no longer than four feet, we have prepared this article, showing how floor lamps may be constructed in sections.

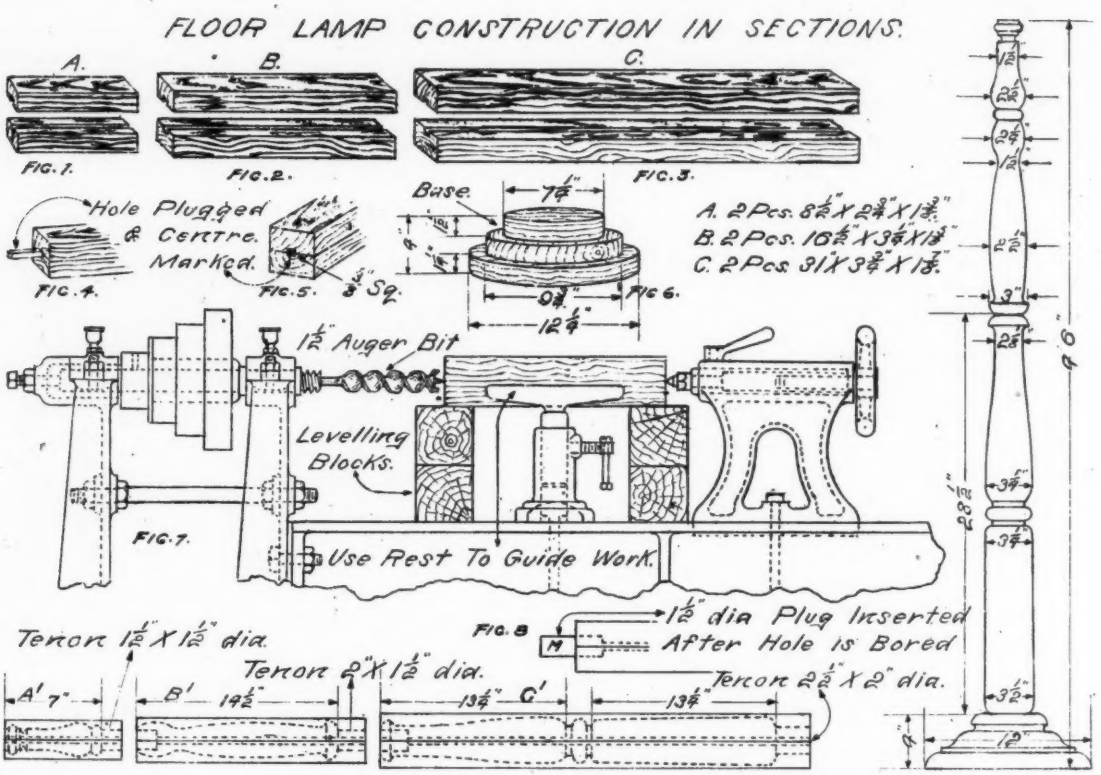
By constructing a lamp in two or three sections, we overcome the difficulty caused by vibration, in turning out long work. We are also able to economize in material, by making use of shorter pieces of wood.

A common objection to this method is the difficulty experienced in fitting the parts together accurately enough to have the complete lamp line up straight. However, by following the details of the work described in the accompanying sketch a surprisingly accurate piece of work may be turned out.

1. Cut to size the stock in sections A, B, and C. Plane a grove 3/8"x3/16" along the center of each, and glue each pair to make the sections.



DETAILS OF FERN BOX.



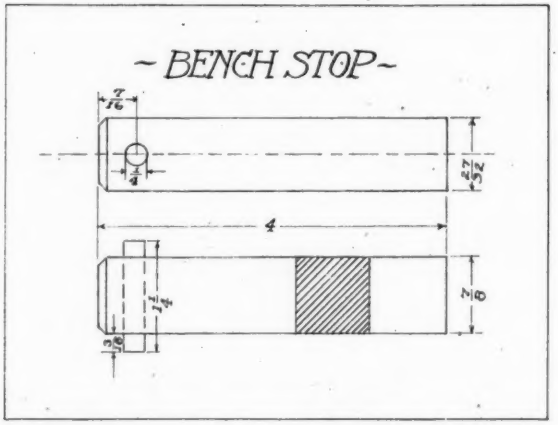
DETAILS FOR TURNING FLOOR LAMPS ON SMALL LATHES.

2. Construct six plugs 3/8"x3/8"x2½", and glue these in the ends (Fig. 4). When dry face off the ends and mark the centers (Fig. 5).

3. Prepare a set of leveling blocks as shown in Fig. 7, so that when placed under each end of the work to be turned, the dead center of the lathe and the center of the bit will be exactly in line horizontally with the center of the work. By lining up the tool rest flush with one side of the work will serve as a guide when boring the hole.

4. The work can be held in position by an assistant, while it is being fed towards the bit, by revolving the wheel of the tail stock. Bore the upper ends of sections A and B, 2½" deep and 1½" in diameter.

5. Turn up a plug 3" long and 1⅜" diameter. The diameter of the end of the plug nearest the live center may be slightly more than 1½".



DETAILS OF BENCH STOP.

6. Insert the plug firmly in the hole bored in the end of one of the sections, about ½" of the plug will project. That end of the plug in which the live center of the lathe has made an impression should be to the outside, so that when the section is placed in the lathe, the live center of the lathe will center in the impression made when the plug was first turned. The idea is to make the plug the true center of the finished work, and to insure proper alignment when the parts of the lamp are fitted together.

7. Sections B and C will be bored at one end and have a tenon turned at the other, 2½" long, 1½" in diameter.

8. After the sections have been turned up and the opening in the center cleared for the wire the parts may be glued together.

9. The base may be built up as in Fig. 6, and shaped and bored on the face plate.

Care must be taken to have the work accurately leveled, and that it is held firmly in position during the boring operation.

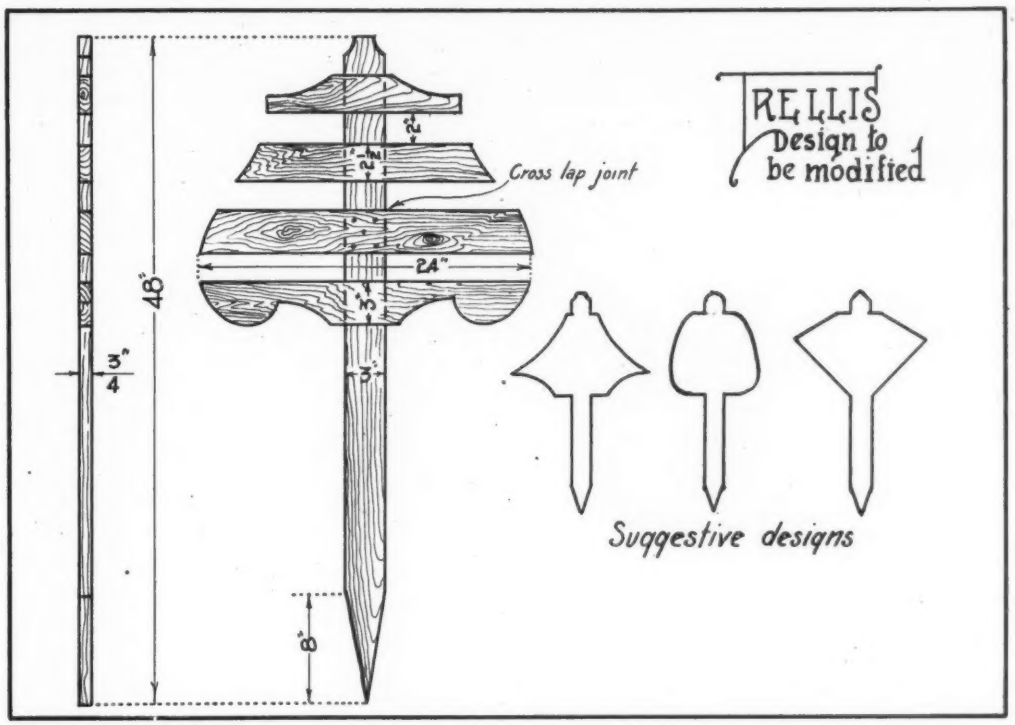
A SERVICEABLE BENCH STOP.

William V. Winslow, North Tonawanda, N. Y.

The drawing illustrates a bench stop which the writer found in use at the high school last year when he undertook his duties at North Tonawanda, N. Y. He presumes it will be new to many teachers as it was to him.

New benches are provided with the necessary stops, but when these are worn or have slipped out on the floor and have been swept out with scrap and shavings other ones must be supplied, preferably of a kind that will not slip out.

Commercial bench stops have their advantages, but for general shop purposes the one here illustrated is satisfactory. It is made of a piece of oak or other hard wood into which is glued a quarter inch dowel. A quantity of these stops should be made up for the purpose of supplying the benches as needed.



DETAILS OF GARDEN TRELLIS AND SUGGESTIONS FOR MODIFYING ITS DESIGN.

A GARDEN TRELLIS.

W. W. White, Waterloo, Ia.

This problem came as the result of a search for something which would involve the cross-lap joint and would give good practice without causing too much loss of time and material if every cut were not perfect.

It is a useful problem in any town where there are gardens and calls for some good judgment in design.

The designs shown were made on folded paper and the cross pieces were gotten out in lengths to fit the designs. In the writer's classes nearly all the lumber was taken from goods boxes.

After the trellises had been completed, they were painted and taken home by the boys.

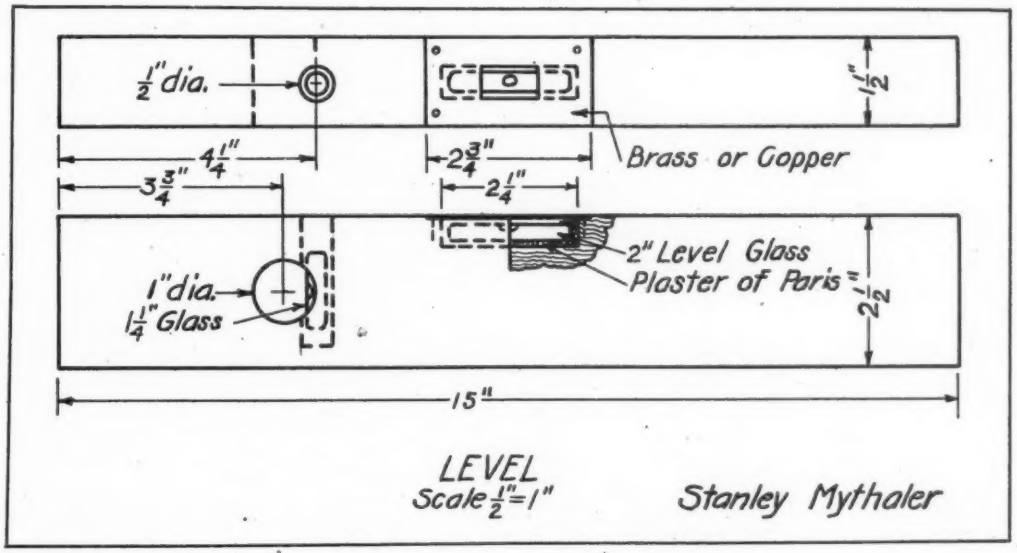
A LEVEL.

Stanley Mythaler, Director of Manual Training, Valley City, N. D.

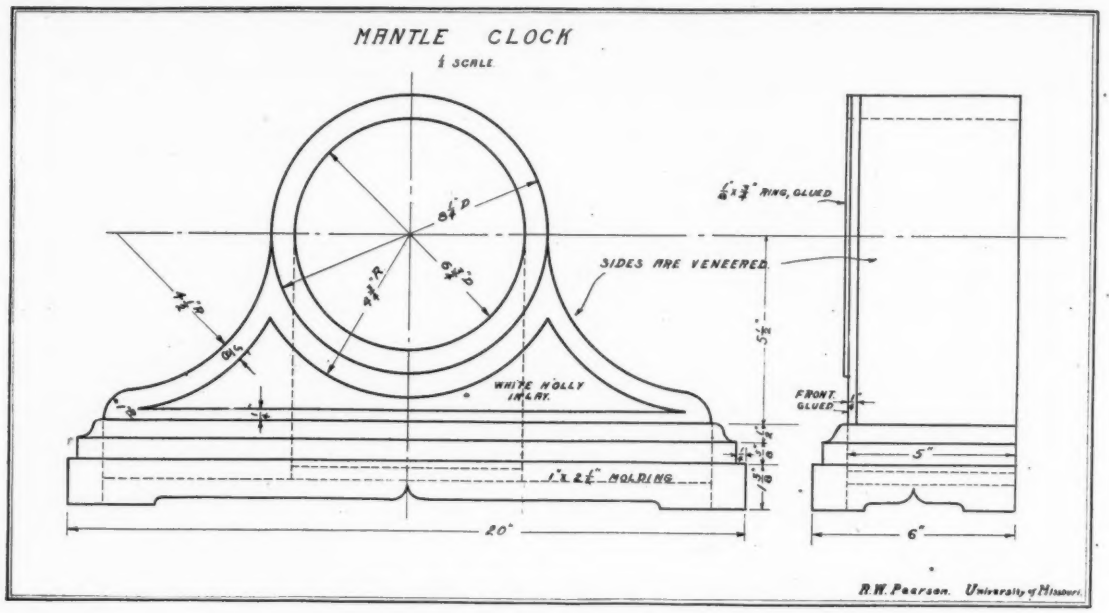
This project was worked out in mahogany and twenty gauge brass or copper was used for the plates. It is desirable that the plates be polished and then shellaced so that they will not rust.

The level glasses were obtained from a large hardware dealer. A carefully adjusted carpenter's level should be used to find a perfectly level and plumb plate in the shop, on which to set a level, while adjusting the glass in the wet plaster.

It is well to set one glass and let it dry for a day as a means of checking the work. The subsequent glass may then be set.



DETAIL OF CARPENTER'S OR MASON'S LEVEL.

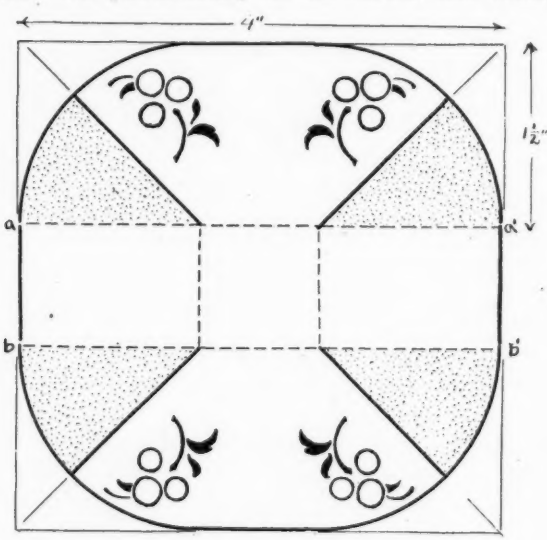


DETAILS OF MANTLE CLOCK.

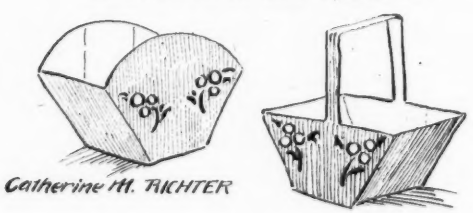
ST. PATRICK'S DAY BASKET.

Mrs. Catherine M. Richter, Long Beach, Calif.

Draw a four-inch square. Measure from the two upper corners down the sides one and one-half inches; and from the bottom corners up one and one-half inches, and connect these points, forming lines a-a′, b-b′. From the edge of the square, measure in on these lines one and one-half inches; connect these four points to form the square base of the basket. With these four corners as centers, draw four quarter-circles, one and one-half inch radius, one in each corner, thus completing the outline of the basket. Bisect each corner.



ST. PATRICK'S DAY BASKET.



Tint the basket green, except the stippled portion, which is to be left white. Draw the design, punching or cutting out the tiny circles, and painting the leaves and stems black. Cut on solid lines, fold the dotted ones. Push the stippled portions in place behind the design, and paste. It can be made with or without handles.

A variation shown can be made by cutting straight across from the intersection of circle and bisecting the line to a point opposite, and to the lettered points, thus eliminating the curved effect.

This project makes a pretty nut cup for the table and has the advantage of being simple and easy to make.

A MANTEL CLOCK.

R. W. Pearson, Instructor in Woodwork, University of Missouri.

This mantel clock has been worked out with splendid success in the shops under the direction of the writer. It involves several principles in woodwork that are rather interesting and in general is satisfactory as involving a large number of processes and forms of construction.

The original clock was made in mahogany and inlaid with holly. Very little difficulty will be had in getting clock works from any jewelry supply house.

A PICTURE FRAME.

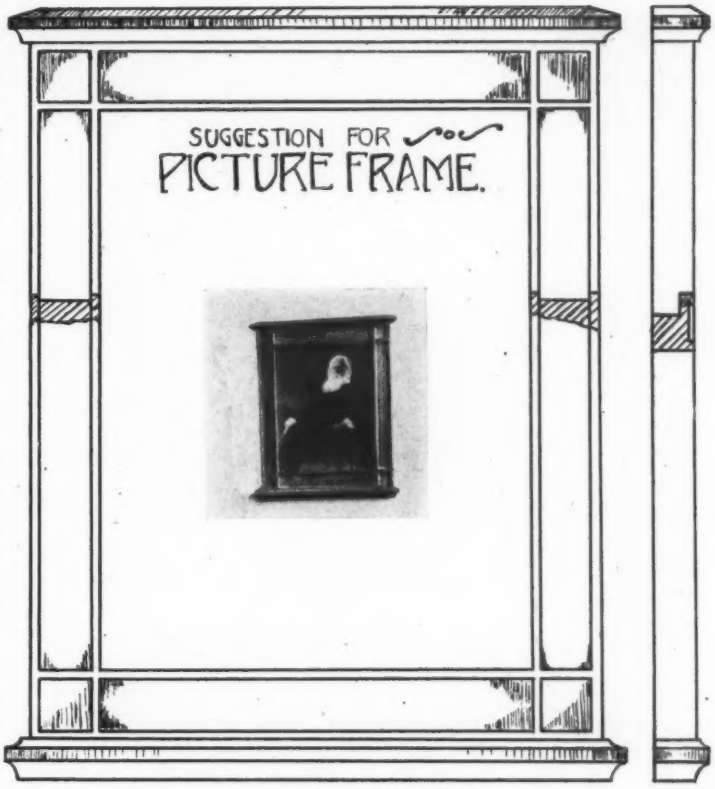
Max Wallenstein, New York City.

This picture frame is designed for the kind of a photograph or painting of a portrait here shown. The frame is a simple adaption of a similar, but more elaborate frame in the Metropolitan Museum of Art in New York City.

The base of the frame is a simple mitre joint with the usual rebate for a picture frame. The strips on the outside and inside edges of this frame are simple pieces of wood which vary from one-eighth of an inch to one-half of an inch in width, their size depending upon the size of the frame. If strips are not desired, the same effect may be obtained by painting a line along the end in place of strips. The size of these strips depends upon the size of the frame.

This frame has been worked out successfully, for the portrait subject, in all sizes, 3x5″, 6x8″, 8x10″, 10x12″ up to three feet by five feet. The top and bottom cornices of the frame are simple pieces of wood, added to the top

and base of the frame after the strips or lineshave have been put on. For finishing this frame, either antique gold, or any shade of color can be used. This in accordance with the tone of the subject framed. There is no limit to the finishes in gilt, polychrome, and dull colors, that can be used in decoration and tone of the frame, to make it a harmonious part of the photo or portrait it adorns.



DETAIL OF PICTURE FRAME.

MAPPING HOME PROJECTS.

J. Q. Adams, Instructor in McMinnville, Agricultural Department.

In order to have the location of each student's home project visualized and conveniently at hand, and to most efficiently and systematically arrange trips for their supervision, the following plan is suggested:

A map or blueprint sufficiently large and in detail enough to show the location of each home project, road, and other important landmark is used. A convenient size is about 18 to 20 inches square with a scale of 1 inch to the mile. The map is mounted on thick cardboard or beaverboard to make it stiff and allow pins to be stuck into it.

A numbered, typewritten list of the students having projects is prepared and posted near the margin or some convenient place on the map.

Pins are stuck in the map at each point where there is a project, pinning down small square pieces of stiff white paper, each with a number corresponding to the number found on the numbered list which was pasted to the map. By this means each pin placed on the map has a number and by referring to the numbered list each can be identified as a certain student's project.

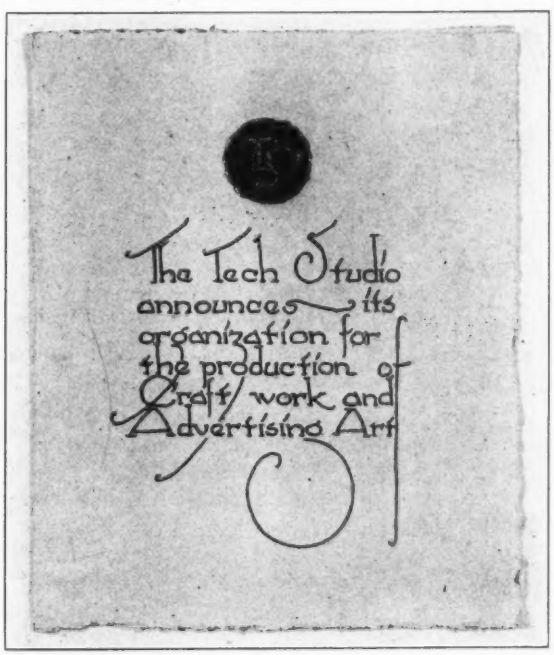
To further increase the value of this map, the pins used can be those with large, colored heads and a color can be assigned to each kind of project. For example, a black headed pin would represent a hog project; a white pin a sheep project; red, beef cattle; yellow, dairy cattle; green, grain project, etc. The color scheme adopted could be made a part of and added to the numbered list referred to above.

In addition, the distances in miles from the high school to each project, as determined by the speedometer on the instructor's car, as well as the usual or average time necessary in making the trip can be recorded and either be placed as an addition to the list on the map, or kept in a pocket memorandum. Remarks concerning the roads, their usual condition, and any other items necessary to know in first making the trip can be included.

A list showing the telephone numbers of each student having a project is convenient to have in arranging trips.

A project visitation record in which each visit to each project is recorded by dates is necessary and a useful aid in preparing reports and preventing a possibility of overlooking some projects.

The plan as suggested records valuable information for use of the instructor and others who may wish to visit projects and locate them unassisted if necessary, or in the case of a change in instructors, temporarily or permanently, gives the new instructor a chance to take up the work of project supervision without inconveniences and more efficiently than would otherwise result.—*Salem, Ore., News-Item.*



Hand Lettered Announcement of the Art Department, Technical High School, Buffalo, N. Y.

THE CHICAGO EXHIBIT OF BIRDHOUSES OF 1920.

The Chicago schools in 1920 exhibited the birdhouses produced in the grade school shops in the great store of Marshall Field & Company.

The firm was so interested in the display that it gave valuable sales space, provided artistic decorations, and prepared special posters—all without cost to the schools. The exhibit, which was prepared under the direction of the elementary manual arts and art departments, daily drew large crowds of citizens.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Refinishing Hardwood Floors and Interior Woodwork.

107. Q:—Some time ago, I bought this house. It is finished downstairs in oak and has oak floors. The woodwork had all been stained and filled, and some of it given a coat of flat-finish varnish. The floors had been scraped, but nothing else had been done to them. The house had been built for several years and occupied during most of the time, so you may judge of the state of the floors at the present time. I am going to ask your advice about finishing these floors.

I am going to re-scrape and sand them, so you may begin with the filler. The other woodwork is stained, what is generally called brown oak. This is for your guidance as to the color for the floor. I should think that this floor with its long seasoning could stand a very hard, inflexible filler. Please give the name of the firms making the materials you advise using. I want to varnish the floors. What do you advise as the best varnish for them? I am partial to Valspar, while I notice that you have recommended Pratt & Lambert's No. 61. I used it over a shellac filler on a table top that I thought would get considerable wear. It has not worn at all well and has checked very badly.

Would you advise filling the rest of the woodwork? Some of it has not been filled at all and some very poorly, and varnish it or leaving it dull? The stair treads have been stained darker than the balustrade. I would like to varnish them to save them from wear. Would you advise trying to get them to the same shade as the adjoining woodwork or leaving them as they are? What is the best white enamel that you know of?—M. B. M.

A:—I would earnestly advise you to hire an electric sander or in case this power is not available, a gasoline sander, in order to properly prepare your floors. Hand scraping on old floors by any man other than one long experienced in the trade, is the most discouraging and back-breaking operation that he can face. The power machine with its coarse sandpaper can rapidly tear the rough surface down to the clean bright wood and when the No. ½ grade sandpaper is placed on the rolls, the sanding machine will produce a splendid surface on floors utterly hopeless from a hand-scraping viewpoint.

Should it be out of the question to obtain either machine, it is best to strip off the old finish with boiling hot water and two pounds of Gold Dust powder to a twelve quart pail of water. This should be applied with a fiber scrubbing brush and allowed to stand five or ten minutes. As soon as the varnish has softened up, it should be mopped up with clean hot water and a large sponge. Avoid slopping on too much water and work a strip five or six boards wide, the full length of the room, rather than in small blocks.

While the floor is still damp, it may be quite readily scraped to a finish, quicker work being accomplished with a beveled-edge scraper, rather than an edge turned on a square finish. In case it is not necessary to remove old varnish, the work of scraping will be rendered much easier by sponging on slightly a mixture of gasoline and linseed oil in proportion of one cup of linseed oil to a gallon of gasoline. This enables the scraper to cut in quickly and avoids the greater amount of drag which the dry surface would otherwise cause.

Assuming that the floor has been scraped and properly sanded, carefully remove all excess dust and work with either rubbers or soft tennis shoes in order to avoid heel marks and scratches. Prepare a filler from silex flour, which has been added to a mixture of twelve parts boiled linseed oil, six parts dark japan drier and one part turpentine, to make a very stiff dough. This produces a filler of absolute permanency and forms a stock material from which sufficient amount may be taken from time to time to act as a base material for colored filler ready for use.

The dough-like material should be diluted with benzine to the consistency of milk and may then be shaded with Van Dyke brown, raw and burnt sienna, raw and burnt umber, French ochre, drop black and rose lake to produce practically any shade of brown that may be desired. Some knowledge, of course, of these tinting colors will be necessary in order to produce the desired shades which can be arrived at only thru a little careful experimentation.

Starting with five or six boards wide on the far side of the room, opposite the door, the filler should be carefully rubbed in across the grain with an old, wide, but rather stuffy paint brush, which has been carefully cleaned. Pieces of burlap cut about a foot square may be used to clean up this strip of brushed on filler, working constantly across the grain, after first using a burlap pad in a rotary motion to force the filler into the pores and cracks. As soon as this is done a fresh piece of burlap may be used to clean up all excess and leave the work free of any smear or cloudiness.

In case the joints in the boards are open and unsightly, they should be filled with the putty-like base material, tinted to the proper shade and carefully tooled into the joints. After this has been done for the entire floors, the regular operation of filling may be performed. The rooms should be closed to exclude dust, and a temperature of about 75 degrees should be maintained for forty-eight hours. After this the floors should be gone over with No. ½ paper without a block in order to clean up any dingy spots left from improperly wiped filler.

For varnishing work on floors, I like to use a quart tin pail with a fine wire stretched tightly from one bale to another. This will enable the brush to be wiped quickly on the wire, thereby avoiding the unsightly sags and partially dried varnish which soon spoil a pail of good material. I have found that a four-inch, heavy, black-china bristle of the flat brush type, or a similar brush of the oval type, forms the most economical means of distributing the varnish.

Never use shellac under varnish on floors. The trouble which you mention as having occurred with P. & L. No. 61 on your table, was undoubtedly due to the fact that you had a considerable amount of shellac as a base material. Shellac affords entirely too smooth a surface in quantity to be used under varnish and in no case should be applied in excess of one coat other than as a sizing material made from stock reduced to the thinness of water with denatured alcohol. On floor work where shellac is used, the varnish inevitably flakes off and regardless of its quality shows white abrasion marks.

The room should be quite warm before attempting varnish work. About 80 degrees is correct, since the floor is always five to ten degrees cooler than the surrounding atmosphere. The work of varnishing should be started as for filling on the side of the room opposite the door, carrying a strip across the room five or six boards wide, and working in such a manner as to enable the workman to see the gloss on the newly varnished surface, thereby insuring an evenly brushed coat, free from skips and holidays.

This first coat should be brushed out evenly and carefully, avoiding any tendency toward flowing on a heavy coat. Cleanliness in the varnish work may be secured by wiping the floor just ahead of the brush work with a piece of clean cheesecloth, which has been thoroly wrung out after all parts have been saturated with varnish. This tacky cloth will pick up and hold on to an unbelievable amount of dust which has escaped the hand least three days, a week is better, after which the gloss of the first coat should be cuffed off with No. ½ paper, brush in dusting. The floor should be allowed to dry at and the hand, avoiding a block. A tacky cloth may then be used to wipe up the floor just ahead of the varnishing as in the case of the first coat. If a dull finish is desired, P. & L. No. 61 dull may be used in preference to the gloss. Let the second coat dry one week before using.

In regard to the stair treads, I would advise that these be scraped and cleaned as for the floors and the color matched; otherwise, so prominent a structure will form a very obtrusive feature in the house.

The woodwork forms a strenuous problem in itself. In case the standing trim is flat faced or plain, it may be cleaned up with "gold dust" and scraped as for the floors.

In case no scraping is undertaken, all work previously washed with "gold dust" should be thoroly sponged with hot vinegar, otherwise the small amount of soap powder left in the pores of the wood may cause future trouble. Perhaps filling with a colored material will produce a satisfactory job, over which one or more coats of varnish may be applied. This varnish work can be rubbed down with 00 steel wool or F pumice stone and a rubbing brush to produce a very satisfactory job.

In case this treatment does not give promise of good results, I am suggesting that all woodwork be washed with a "gold dust" solution in the proportion of one cup of powder to a twelve-quart pail of warm water, in order to remove the collection of dust and grime accumulated thru years of use. Use a good, stiff scrubbing brush and plenty of elbow grease. Clean off with a sponge and plenty of water and afterwards wash down with vinegar. Let the work dry a couple of days; fill all necessary portions with an uncolored filler; let dry forty-eight hours; sand clean; wipe off with a tacky cloth and lay on a carefully applied coat of P. & L. undercoater, tinted to whatever shade is desired. At least two coats of undercoater should be applied and sanded carefully between coats. Over the last coat brush on Vitrolite Egg Shell Enamel tinted to the desired shade.

Without having actually seen the job in question, I am offering these suggestions as a possible means of what will probably prove a most trying job.—Ralph G. Waring.

White Metal.

149. Q:—Is it possible that you could give me one or two successful formulae for the mixing of metals for white or soft metal castings, or could you give me any references?—H. T. F.

A:—Metal Workers' Handy Book, by Wm. T. Brannt, H. C. Baird & Co., Inc., New York; Henley's Book of Recipes, Formulaes and Processes, N. W. Henley Publishing Co., New York.

Dust Cloth Compound.

163—Q.: What is a good compound for using on a dustless mop? One can buy a preparation but it seems very expensive to me and I thought I could make my own if I had a good formula.—M. B. M.

A.: For all practical purposes the following formula is satisfactory for use on dustless mops and cloths for cleaning floors:

One quart of paraffine oil.
One pint of turpentine or benzine.
One teaspoonful of oil of cedar.

Ralph G. Waring.

Removing Spots from Ivory.

165—Q.: I have had several women ask me if I could remove the brown spots from French ivory toilet articles. These spots were caused by toilet waters and face lotions and come on very gradually. In time they turn to ugly brown spots. Can you tell me any chemical that will remove these spots and not injure the ivory.—R. W. J.

The spots can be removed by the application of a cleaning cream made by the manufacturers of the toilet ware provided this is done immediately after the toilet water has been spilled on the toilet article.

If the spots are not given prompt attention, and sink further into the material, there is no "home made" way to remove them. The only possible way of doing this requires rebuffing and refinishing and this must be done at the factory where the toilet ware is made. If it happens to be ivory pyralin, the owner can have this rebuffing and refinishing done by sending it to her dealer who will return it to the manufacturer. This work is charged to the customer at actual cost.

NEW BOOKS

Pine-Needle Basketry.

By Linna L. Millikin. Cloth, royal octavo, 38 pages. J. L. Hammett Co., Cambridge, Mass.

This book will be welcomed by teachers and craft workers who have undertaken to make mats and baskets with that fascinating new material—the long-leaf pine needle.

The book begins with illustrated explanations of the very simplest processes—the preparation of the materials, the typical stitches, the working up of the forms and finishing.

The final section contains detailed directions for making a number of special forms of trays, mats and baskets.

The book is exceptionally well illustrated and printed.

Pattern Making.

By Joseph A. Shelly. Cloth, octavo, 341 pages. The Industrial Press, Publishers, New York, N. Y.

This book is a complete presentation of the methods of making and using patterns for metal casting. The author introduces his subject by defining the various types of patterns and describing their use. He then takes up the problems of tools and machinery and proceeds to pattern joinery from the simplest forms to the most complicated. Core box construction, pattern turning, cylinder wheel, propeller and gear patterns are then in sequence. The difficult combination pattern and complicated work of the largest sizes complete the work. Special chapters on finishing of patterns, on lumber and on the care of saws, are added. A large quantity of typical patterns is included in the illustrations and much information is given to assist the reader in meeting common problems and difficulties. Care seems to have been taken, however, not to include any variety of unrelated problems, but rather to make every illustration and every paragraph of the description cover an essential fact, or principle, necessary to the logical development of the subject.

The book makes a strong appeal for reference and supplementary reading purposes, both for the experienced pattern maker and teacher of the subject. Students will find it a decided help for clarifying shop explanations and making right principles stand out in clear relief from routine processes.

Carpentry for Beginners.

By Wm. Fairham. Cloth, 12mo., 217 pages. J. B. Lippincott Co., Philadelphia, Pa.

This book will be found an excellent addition to the school library. It is a rather complete guide to the elementary principles and processes of wood working. In addition to explanations of tools and tool processes, it suggests a series of small carpentry and simple cabinet making problems.

How Paper Boxes Are Made.

By Robert F. Salade. Cloth, 12mo., 225 pages. The Shears Publishing Co., Lafayette, Ind.

The box-making business is an offshoot of the book bindery and has, in recent years, grown to such proportions that it exceeds in the value of its products, the parent industry. Folding boxes, set-up boxes, corrugated shipping containers, fiber shipping boxes, fancy boxes—what business does not sell and what individual does not buy goods packed in one or more of these productions of the box maker?

The present book is a general descriptive work—the pioneer in the field. It describes in detail the materials, machinery, tools and processes of making the most generally used paper boxes. It is untechnical in treatment but sufficiently inclusive to appeal to the expert as well as the learner and the general reader.

The book will make an excellent addition to any vocational guidance library and will be especially helpful for teachers in communities where the industry exists. In some future edition the author might well add a chapter on the occupational possibilities of the industry, including analyses of the trades included, processes, and wage opportunities.

Practical Trade Mathematics.

By James A. Moyer and Charles H. Sampson. Cloth, 169 pages, illustrated. John Wiley & Sons, Inc., New York.

This arithmetic addresses itself to electricians, machinists, carpenters and plumbers. The lessons deal with the practical mathematics of the workshop. Tools, devices and machinery come into play. Measurements, dimensions and contents are brought to the studies.

The ten chapters of the book include fractions, percentages, ratio and proportion, and the practical application of geometry. The illustrations, which deal with wood, iron and other products, serve to enhance the interest in the lessons that are woven about them.

The authors have succeeded in bringing to their service the very things that will hold the attention of the mechanic and give him the practical mathematics so helpful in productive labors.

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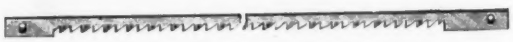

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SCHOOL CRAFTS CLUB MEETING.

The School Crafts Club of New York City held its second regular meeting on January 15th, at Hoboken, N. J. The members who assembled at the Hoboken Library Building, divided into two groups for inspection trips to the Keuffel & Esser Plant and to the Stevens Institute.

Following the inspection trips, a business meeting was held. The names of five candidates were proposed for membership. The officers elected were as follows:

R. A. Beyer, President; M. J. Corcoran, Vice-President; Philip M. Wagner, Secretary, and Edwin F. Judd, Treasurer.

ART TEACHING IN NEW YORK CITY HIGH SCHOOLS.

The art department of the New York City high schools has issued an extensive report covering the years 1918 to 1920, which emphasizes the diversity and quality of the art training given. It shows how important and practical the art teaching has become and the illustrations emphasize the professional standards which have been demanded. These appear in the commercial work in posters and advertisements in the several craft exhibitions which the schools have held, and in the cooperative service of the schools with the toy associations and other business organizations.

It is the double function of the New York high schools to provide for the aesthetic training of all the children in taste and the technical training of the gifted in skill. New York City has the largest high school art department of any city in the country, embracing 150 studios and enrolling nearly 50,000 students in the required art work of the first two years of high school.

Director James P. Haney, who believes thoroly in cooperation, indicates in his report, how many different agencies have been brought into cooperative relations with the schools. These embrace the art museums, art societies, trade and social organizations. Trade conferences and exhibitions are regularly held, while a School Art League is used to develop the museum courses and special classes.

The value of special training for the talented is indicated in the great growth of the higher elective courses. These courses were developed during the war in response to a belief that the industrial art needs of the country would assert themselves with the coming of peace, and have since justified that belief. The trades have absorbed the talented graduates of the high schools as rapidly as they were prepared. At present special art courses are offered in a dozen high schools, and a scholarship plan has assisted in the training of scores of pupils in post-graduate work in industrial art. Dr. Haney characterizes this as the most striking advance made by the art department in a decade because it has made possible a saving scheme of real importance. It means that boys and girls gifted with artistic ability have offered to them, opportunity to cultivate that ability at the same time they gain a general high school training. The student is thus enabled to use the high school as an agent of training both general and technical, which will advance him into the industries.

A VOCATIONAL GUIDANCE PROGRAM.

The schools of North Adams, Mass., have adopted a vocational guidance program consisting of twenty points of activity. The program which was prepared by Supt. B. J. Merriam, is as follows: Vocational books for reference and reading; vocational talks to be given by outside speakers once each month; a study of vocations in connection with sub-freshman work in civics; a study of three different vocations in each of the upper grades; debates in upper grades and high school as to vocations, industries, etc.; prepared vocational talks by students in assembly; vocational talks by seventh and eighth grade pupils as part of special programs; vocational talks by the teachers to pupils of the third, fourth and fifth grades; motion picture films of vocations and industries; prize essays on vocation in junior and senior classes as part of the English work; high school teachers explain the vocational bearings of their high school courses to upper grade pupils and to high school students; a vocational bulletin board in each school building; vocational counselling by high school advisors; a vocational conference between students of the sixth, seventh and eighth grades and the teachers; assigned vocations to be reported in writing by

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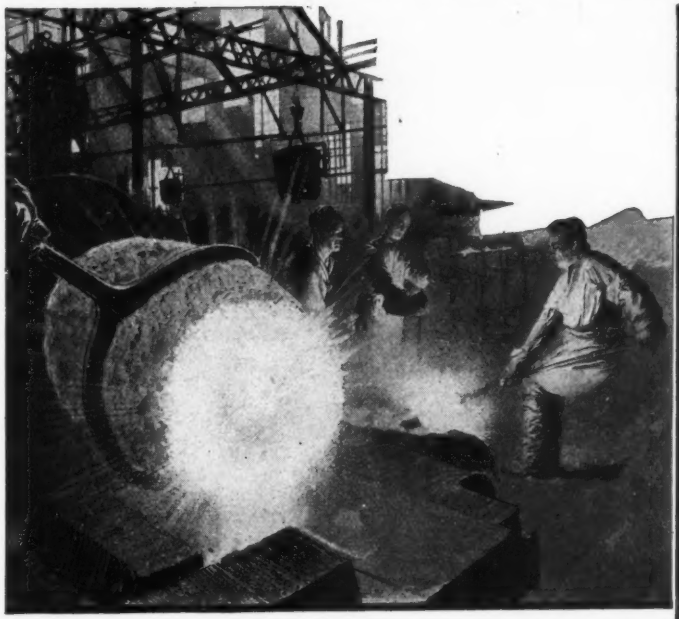

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A Wiley Technical Series Book, Edited by Joseph M. Jameson.

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(Carpenters and woodworkers in general, and builders in brick construction, will find this book of great practical utility.)

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I-AM 3-21

(*Continued from Page* XXII)

high school graduate; factory, office and shop visits by pupils under the teacher's direction; one big parent-teacher vocational meeting each year; public library references with regard to vocations; a vocational guidance committee from the teachers to suggest additional activities and to promote the existing program.

EASTERN ARTS CONVENTION.

The annual meeting of the Eastern Arts Association, which will be held March 24, 25 and 26, at Baltimore, Md., will be of special interest. Maj. Fred P. Reagle has charge of the arrangements for the program and Mr. Theodore H. Pond is chairman of the local committee on arrangements.

The headquarters for the meeting will be at the Maryland Institute, where ample accommodations have been obtained for the several sessions as well as the commercial and educational exhibits. The meeting place is convenient to the railroads and to the different hotels of the vicinity.

At this meeting it is planned to stimulate industrial art interests thruout the South Atlantic States. The program will provide definite time for automobile trips and visits to the art galleries, museums and places of historic interest. As Baltimore is only an hour's ride from Washington, it is also possible for visitors to visit the National Capitol.

For information concerning the meetings or exhibits, address Prof. Walter R. Gale, Baltimore City College, Baltimore.

NEWS AND NOTES.

Art Students' League of New York Scholarships. The Art Students' League of New York will hold a scholarship competition, which is open to all art students in the United States, with the exception of those in New York City, on March 25th, 1921.

Ten scholarships will be awarded to the most promising work in any medium, from life, the antique, landscape, etching, portrait, illustration, composition, and photographs of sculpture. To facilitate the work of the jury, which will consist of nineteen instructors of the League, students entering for this competition are urged to send the most comprehensive exhibition possible.

All letters and packages should be addressed "For Scholarship Competition, Art Students' League of New York, 215 West 57th Street, New York City," and should be entered not later than March 19th, with return express or parcel post charges prepaid.

The scholarships will enable the holder to free tuition in any two classes of the League during the season of 1921-1922, or in the classes of the Woodstock Summer School of Landscape and Figure Painting for the season of 1921.

Minnesota Convention. In the general section of the industrial and household arts departments, of the Minnesota Educational Association, the following were elected officers for the coming year: Prof. Homer J. Smith, College of Education, University of Minnesota. President; Miss Marie C. Henneger, Lyndale School, Minneapolis, Vice-President, and L. F. Knowles, Director of Manual training, Mantorville, Secretary.

J. E. Painter, supervisor of manual training in the Minneapolis schools, was elected president of the manual training department for the year 1921; John F. Friese, of St. Cloud was elected secretary.

The main theme running thru all the meetings of the industrial and manual training sections was compulsory part time education and evening schools. Professor Ira S. Griffith spoke on general industrial training for general educational purposes. Prof. Koos of the Minnesota university, presented his conclusions regarding the purpose of the junior high school. Prof. Smith spoke of the institution and trade-trained vocational teachers, their merits, failings and the part each can play to best advantage. Geo. M. Brace, St. Paul, strongly advocated separate schools for the teaching of vocational education. Miss Fish, of Minneapolis, presented the vital present-day problems of vocational education for girls.

Increase for Disabled War Veterans Denied by House. An amendment for an increase in the appropriation of $33,000,000 to $47,000,000 for the care of disabled soldiers, which was offered by John Jacob Rogers of Massachusetts, has been voted down by the House of Representatives. The chairman of the House Appropriations Com-

(*Continued on Page* XXVI)

Printing Processes—No. 4

Platen Presswork

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ALL the various technical processes of printing possess fascination for the average healthy boy, but none of these processes appeal to him more than presswork. Platen presswork is the first step in producing the actual printed product. Only the purely technical and vocational printing courses include cylinder presswork, but all school equipments include platen presses.

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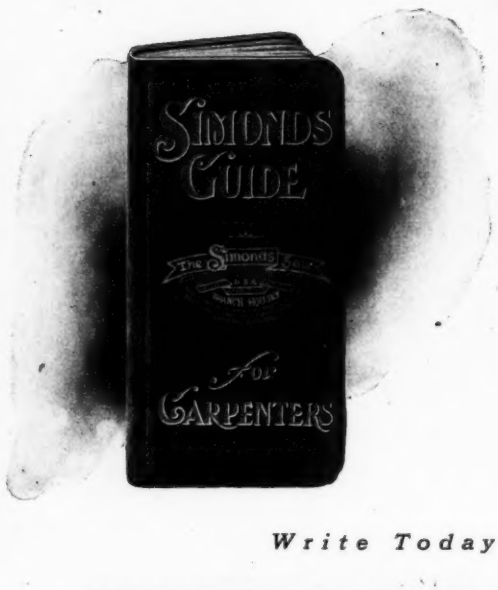

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(*Continued from Page* XXIV)

mittee claimed that there were adequate facilities for caring for the wounded men without entering into a vast program for constructing new hospitals. Mr. Rogers pointed out that there are 20,000 war risk patients now being cared for in the government hospitals which number will run up to 30,000 by October 1st, an increase of about 50 per cent. He said that the peak of the hospital load will not have been reached before 1927 and may not be reached before 1929. Mr. Rogers stated that there are now about 6,800 medical and surgical cases, 7,900 tubercular and 5,200 neuro-psychiatric; while the first two had reached their peak, the last two will increase from month to month and will continue from seven to nine years, which is surely a justification for an increase.

Vocational Training Conference. A Southern Regional Conference was held in the Senate Chamber at the Capitol in Montgomery, Ala., with an attendance of more than 200 vocational educational workers and teacher trainers, representing the states of Kentucky, Tennessee, Georgia, Mississippi, Alabama, Florida and Louisiana. Dr. Uel Lamkin, Federal Director of Vocational Education, called the meeting for the purpose of planning the work for the coming year. He laid particular emphasis on the work of training teachers and supervisors to carry on the vocational work in the southern states.

The shop apprentices of the Commonwealth Fellowship School at St. Louis, have taken a serious interest in the work of the school and have entered into it with real determination to advance. The importance of the school training is emphasized more and more and its value is probably more generally recognized thruout the plant than it has ever been in the past.

The school has a total registration of 89 students, of whom 58 are apprentices attending school as part of their training, 25 young men who are attending school on their own time, and six government students who are taking courses under the supervision of the Federal Board. Of the apprentices now enrolled, 25 are from the molding department, five from the drafting room, two from the construction department, six from the machine shop, ten from the pattern shop, four from the electrical department, three from the metal pattern shop, and three from the office. The only department which is not yet fully represented by its apprentices is the molding department, but nearly all of the molder apprentices are now in the school.

Delgado Central Trades School Has Managing Board. The Delgado School, at New Orleans, will have a board of managers composed of four new members due to certain changes in the municipal election. The members are Andrew J. McShane, President of the board; Wilbert Black, commissioner of public property; Daniel J. Murphy, president of the Orleans parish school board, and Henry C. Schaumburg, member of the Parish school board.

The other members of the board remaining in office are Joseph Kohn, vice-president; E. E. Lafaye; J. M. Gwinn; Samuel W. Weis; George J. Glover; Prof. Douglas S. Anderson. The Director, M. G. Martin, will not be changed, and probably not the secretary, Louis A. Dodge.

The school is expected to be ready for occupancy in March, 1921.

The United States Civil Service Commission has announced open competitive examinations for teachers and an educational director in commercial, technical, agricultural, trade and industrial subjects. A salary of $1,800 to $2,400 is offered for a director and salaries of from $1,600 to $3,400 for the teachers.

Applicants should apply before May 3rd for Form 2118, and should state the title of the examination desired, to the Civil Service Commission at Washington, D. C., or any branch office.

Evening Courses in Typography. The evening session of the College of the City of New York announces special courses in the several phases of typography which are open to both men and women. To those who are engaged in editorial work, advertising, proof reading, printing and other occupations connected with printing and publicity, the courses will be of special interest. The courses which consist of sixteen lectures are conducted by Mr. Arnold Levitas. Certificates of proficiency are issued on completion of the course.

Illinois Cities Have Schools on Part Time. Fifteen cities in Illinois have established part-time schools, making attendance compulsory on the part of children in employment between 14 and 16 years of age. The cities

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(*Continued from Page* XXVI)

are Aurora, Bloomington, Chicago, Cicero, Eldorado, Decatur, Galesburg, Granite City, Joliet, LaSalle, Lawrenceville, Peoria, Rockford and Springfield. The state director has urged that part-time schools be established in all cities of the state before the law becomes effective in September, 1921.

Schools Study Industries. The schools of Cincinnati, O., have begun a study of the local industries. In the lessons, industrial facts from special pamphlets and motion pictures are utilized. The purpose is to concentrate the vocational training so that at least one year will be saved to the pupils and to give more attention to the fitting of pupils for different vocations.

Printing Courses Offered. Print shops have been established in the Central High School and in four grade schools at Akron, O. The high school shop is a vocational establishment where the high school paper is printed and where forms, bulletins and special printing are done for the schools. In the grade schools, the work is of the "acquaintanceship" character and is intended to prepare the pupils for more advanced work in the high school.

Vocational Budget Reduced. The Wisconsin State Board of Education has made a reduction of nearly $200,000 in the vocational budget.

Normal Schools for Tradesmen. Normal schools for the training of tradesmen as teachers have been formed in the nine cities of Connecticut, embracing Meriden, Stamford, Danbury, Torrington, Putnam, Bridgeport, South Manchester, New Haven and New Britain. Classes are held two or three evenings each week and students are made up of workers who have qualified for the work. The purpose of the training schools is to provide more and better workers for the skilled mechanics. It is possible to so train the men in the factories that they will be able to teach the young mechanics the principles and practice of the trade.

A Dull Season Course. The Iowa State Board of Education has cooperated with the local board at Des Moines, Ia., in offering a dull season short course for painters, paperhangers and decorators. The course ran for three weeks and was divided into units of one week each.

Students Build School Building. The students of the Lathrop and Manual Training High Schools of Kansas City, Mo., have constructed a one-story building for the music department. The building which contains four rooms, was completed in six weeks' time. The work was under the direction of Mr. M. G. Burton, director of vocational training, and Mr. R. H. Brown, supervisor of instrumental music.

New School of Household Arts. A school of household arts has been established at New Rochelle, N. Y., under the direction of Mrs. Mary E. Nichols. At the school instruction is given in electric cookery, how to preside and serve at table, the use of an electric sewing machine, how to use a fireless cooker and how to wash dishes without wetting the hands.

New Evening Course. A course in commercial illustrating and design has been begun at the evening technical school at Providence, R. I. The work is divided into design, commercial problems, advertising, reproduction, commercial illustration, and cartoons. Mr. C. F. Shea is instructor for the class.

Propose Industrial School. Mayor R. A. Kenyon of Pawtucket, R. I., in his annual budget, suggests that $700,000 be appropriated for an industrial school. It is planned to give special attention in this school to the teaching of textile branches, in view of the industrial and textile makeup of the city's industries.

Shop Men Take Mechanics. Classes in shop drawing and blue print reading have been formed in the manual training department at Missoula, Mont., for the benefit of shopmen employed by the Northern Pacific Railroad. A class of fourteen has enrolled for the work.

Sloyd School to Expand. The Boston Sloyd School is planning a change in policy and name and the formation of a corporation. It is the purpose of the directors to obtain additional funds and to enlarge the facilities for work in industrial therapy.

Vocational Guidance in Chicago. The Chicago Vocational Bureau has reported that 120 children between 14 and 16 years were kept from the factories during the past year and were given opportunity for a high school education.

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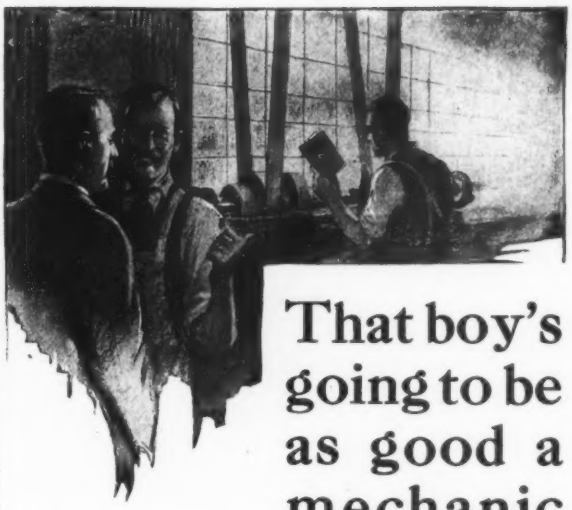

That boy's going to be as good a mechanic as his father.

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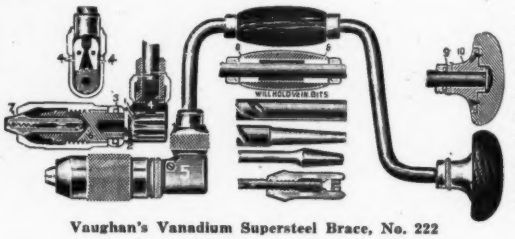

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(*Continued from Page* XXIX)

Vocational advisors have been placed in each high school to assist pupils in obtaining employment and to advise them as to their business careers. Applications are received from pupils and graduates for employment, and also calls from employers for workers.

Vocational School Leases Building. The Lincoln Institute for Vocational Education of New York City, which is engaged in the work of training disabled service men, has leased a building at 692 Broadway, and will enlarge its facilities for educational purposes.

Board Discontinues Director. The school board of Cambridge, Mass., upon the recommendation of the superintendent, has discontinued the office of director of vocational guidance, which had been vacant since the appointment of the incumbent to the assistant superintendency. It is the belief of the superintendent that the work should be done by the masters and teachers in the schools. Miss Maud Deehan who had previously held the office was continued as assistant in the vocational department.

Miss Frances Zull has been appointed supervisor of household economics at Baltimore, Md.

Mr. Lewis B. Crompton, of Philadelphia, Pa., has been appointed instructor in the continuation school at Gloucester, N. J.

Surgeon General Asks for Funds. Surgeon General Cumming of the U. S. Bureau of Public Health Service has asked for $30,000,000 to properly care for the increasing number of American service men who suffer from physical and mental diseases. According to the surgeon general, the present rate of increase in patients in hospitals of the health service is about one thousand per month, and it is expected that before the peak is reached, the number of beds on request will reach 30,000 to 35,000. The peak may not be reached before 1927 or 1929. In view of present conditions it is estimated that about 10,000 beds are urgently needed, which at an estimated cost of $3,000 per bed, would require $30,000,000.

The Vocational Division of the Massachusetts Department of Education is conducting training classes for industrial teachers in several of the larger cities. These classes are under the direction of Mr. M. Norcross Stratton, Agent for Teacher-Training in Men's and Boys' Continuation Schools. At the present time there are two groups in Boston, one each in Worcester, Springfield, Lowell and Fall River, for prospective teachers in industrial schools. These classes meet two nights a week and are in session 25 weeks. An opportunity is given for practice teaching in the day and evening vocational schools.

Classes for continuation school teachers and for employed teachers are also being conducted in Boston, Worcester, Springfield, Lynn and Lawrence.

There is a total of 131 men enrolled in the pre-employment classes and 81 men enrolled in the classes for professional improvement.

The staff of teachers includes Mr. G. A. Burridge, Principal of the Springfield Vocational School, Mr. Harry L. Jones, Director of the Somerville Vocational School, Mr. Maurice J. Moriarty, Director of the Charlestown Part-time High School, Mr. Francis L. Bain, Assistant Director of Manual Arts, Boston, Mr. James W. Dyson, Instructor, High School of Commerce, Boston, Mr. C. K. Moulton, Principal of the Fall River High School, Mr. Thos. F. Fisher, Director of the Lowell Vocational School, Mr. Edgar P. Neal, Head of the Academic Department at Worcester Boys' Trade School, Mr. Ralph W. Babb, Director of the Lynn Continuation School, Mr. Patrick J. Smith, of the Boston Public Schools and Mr. Charles B. Rose, of the Springfield Vocational School.

The Vocational Division of the Massachusetts Department of Education has undertaken the work of training foremen along the lines of the course given at Oswego last summer by Mr. Charles R. Allen. The work in Massachusetts is under the direction of M. Norcross Stratton, Agent for teacher-training. At present representatives from various industries are being trained as conference leaders. After securing training these men and women expect to conduct conferences and classes for foremen in their respective plants.

The first class was established in Boston in November with Mr. A. H. Morrison, who was associated with Mr. Allen at Oswego, as instructor. There are sixteen men and women in the Boston group including employ-

(*Continued on Page* XXXIII)

"CHAMPEEN" BASKET WEAVERS

These smiling youngsters are the "champeen" basket weavers of Miss I. C. Hook's class at the University Hospital, Social Service Dept., Ann Arbor, Michigan. They use *Art-Fibre* Cord and *Art-Fibre* Stakes, Best Weaving Material.

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(*Continued from Page* XXX)

ment managers, industrial relations managers, personnel and educational directors, production managers, training instructors and superintendents representing eight industrial concerns.

Another class is being conducted in Springfield and later similar classes will be started in Worcester, Pittsfield and other leading industrial cities.

Vocational Society Formed. A state society for vocational education has been formed in Pennsylvania, for the purpose of promoting vocational education and affording opportunities for the presentation and discussion of various problems of vocational education; to make available the results of experience and work accomplished in the various fields of vocational education, and to cooperate with the other agencies for the advancement of the work in the state. The society has adopted a constitution and bylaws to govern the work of the organization. The officers for the current year are as follows: President, L. H. Dennis, State Director of Vocational Education, Harrisburg; Vice-President, James Killius, Director of Vocational Education, Johnstown; Secretary-Treasurer, H. E. Todd, Director of Vocational Education, Harrisburg.

New Trade School at New Orleans. The new Delgado Trade School at New Orleans, La., will be opened January 1st. The structure owes its establishment to Isaac Delgado, a wealthy citizen of New Orleans, who died, leaving a will which provided a fund of $800,000 for the establishment of a trade school for men and boys. The original amount was put at interest by the city and has now grown to a million and a quarter dollars. By the terms of the will all the money must go into buildings and equipment.

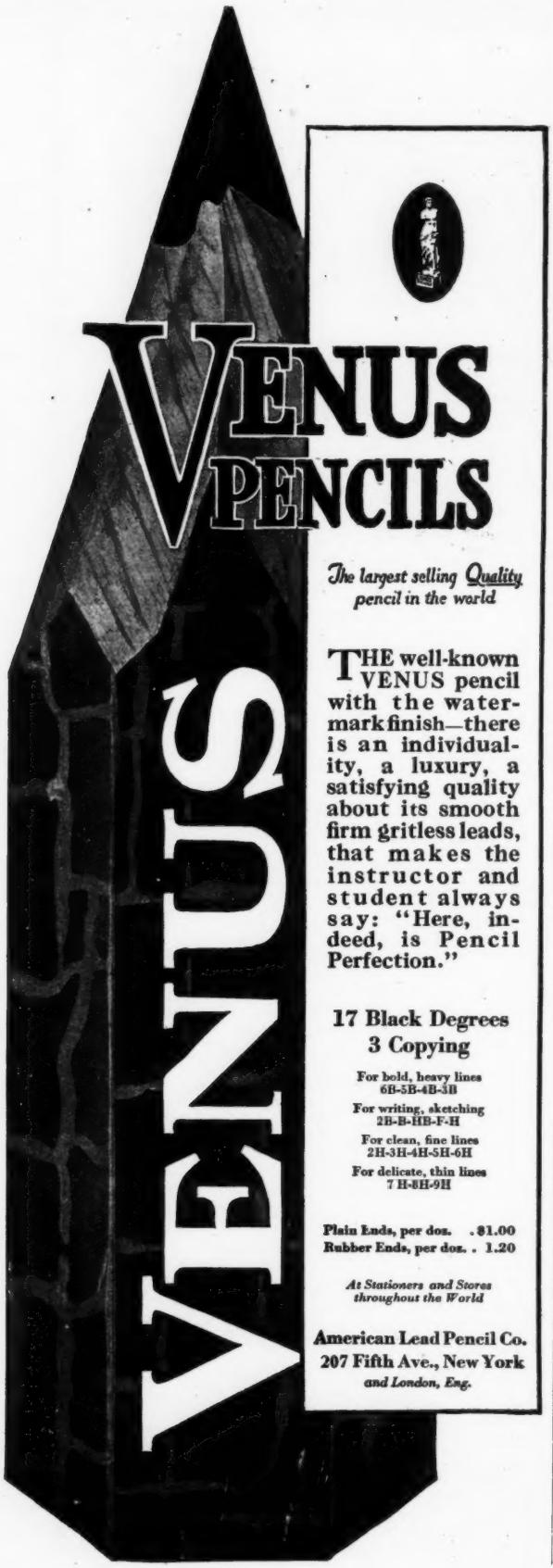
The school will have a large annual maintenance fund in view of the fact that federal and state aid is given for trade education.

A unique plan of factory production has been carried out in the mill class conducted at Stout Institute, Menomonie, Wis. The class is divided into inexperienced and experienced mill men, the first getting out stock per orders of the other departments, and the second unit taking up quantity production work, similar to actual factory methods. Tables, drawing boards, etc., are carried thru all stages from selection of stock to assembling, gluing and finishing.

Methods of selecting stock, scaling, resawing, ripping, planing, joining, mortising and tenoning are carefully taken up, and each machine is studied as to operation, care and dangers. Comparatively thoro analyses are made as the different jobs progress.

Part-time School Department Established. An interesting "part-time" school department has been inaugurated in connection with the Hammond, Ind., schools. Under the direction of Supt. E. S. Monroe, a special course of study has been provided for these pupils and the daily lessons are prepared by the teachers for each subject covered. At present, courses have been prepared for civics, hygiene, arithmetic, English, home economics, bookkeeping, mechanical drawing, woodwork, forge work and automobile repair. The manufacturers in many instances have co-operated with the establishment of part-time schools for employes between 14 and 16 years of age. No child under 14 years of age is permitted to leave school for work, and all those between 14 and 16 must apply for work permits and must attend a part-time school eight hours a week. A total of 330 part-time pupils are in school, with three teachers in charge of the instruction.

The Western Arts Association, which was formerly called the Western Drawing and Manual Training Association, will hold its next meeting in Peoria, Ill., May 3rd to 6th, inclusive. The present membership includes the leading educational people who are interested in art, manual training, home economics and vocational education. The present officers are: President, Miss Ruth Raymond, head of the Department of Art Education, University of Minnesota; Vice-President, Mr. Albert F. Siepert, Dean, Industrial Teacher Training, Bradley Polytechnic Institute, Peoria, Ill; Chairman of the Council, Miss Florence H. Fitch, Director of Art Instruction, Indianapolis Public Schools, Indianapolis, Ind.; Secretary-Treasurer, Mr. L. R. Abbott, Director, Department of Manual Training and Industrial Education, Grand Rapids, Mich.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BUYERS' NEWS COLUMN

SOME SIDELIGHTS ON WOOD STAINING.

The average mechanic who uses a tool, a material, or a process in his daily work rarely, if ever in his life-time, thinks of the ingenuity and effort that has gone into a particular article. He would much more appreciate his tools and his materials if he knew something of their history and evolution, of the trials and failures and of the generations of inventive labor of which they are the sum total.

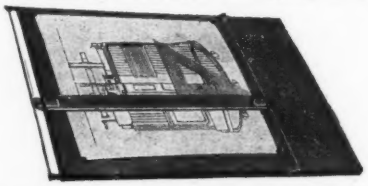
Thus the finisher in the present-day furniture factory, or the amateur in the home, has no inkling of the methods which obtained in the centuries past. He may have heard, and he will repeat, that in the good old days cabinet woods were better, and varnishes were more permanent. But, he does not know how laborious and slow and how costly were the processes of even a half century ago and he cannot appreciate that the stains and finishes which are now available to the humblest bungalow dweller were reserved for the nobility and the richest gentry of a century or more ago. He may complain of the speed of the present finishing methods, but he could not be induced to use the materials and the methods of the cabinet finisher of the eighteenth century for twice his present day-wage.

Some interesting sidelights on the history of wood stains and wood finishing have been set down by a leader in the American woodstain industry, Mr. C. J. La Vallée, president of the Marietta Paint & Color Co., and have been issued by him in pamphlet form. The effort and the inventive genius of earlier and recent makers of wood stains are brought out by Mr. La Vallée and the wonderful advantages enjoyed by present-day finishers are made clear.

The booklet will be welcomed by teachers who have sufficient interest to teach their classes more than commonplace methods. For teacher as well as pupil it will give perspective and understanding of types and uses of stains and of troubles overcome by pioneers in the making of stains. The booklet is gratis to instructors.

A NEW DRAFTING CONVENIENCE.

The New York Blue Print Paper Company has just put on the market a device for simplifying parallel ruling. It is known as the Precise Parallel Ruling Attachment, and can be applied to any drawing board. The accompanying illustration shows the device in use in an ordinary mechanical drawing. In brief, it consists of



two cords, managed on the drawing board and a straight edge adjusted between the cords by means of special brackets to pulleys. The pulleys are accurately attached in such a way that the straight edge can be adjusted to any angle and will maintain this angle when moved up or down.

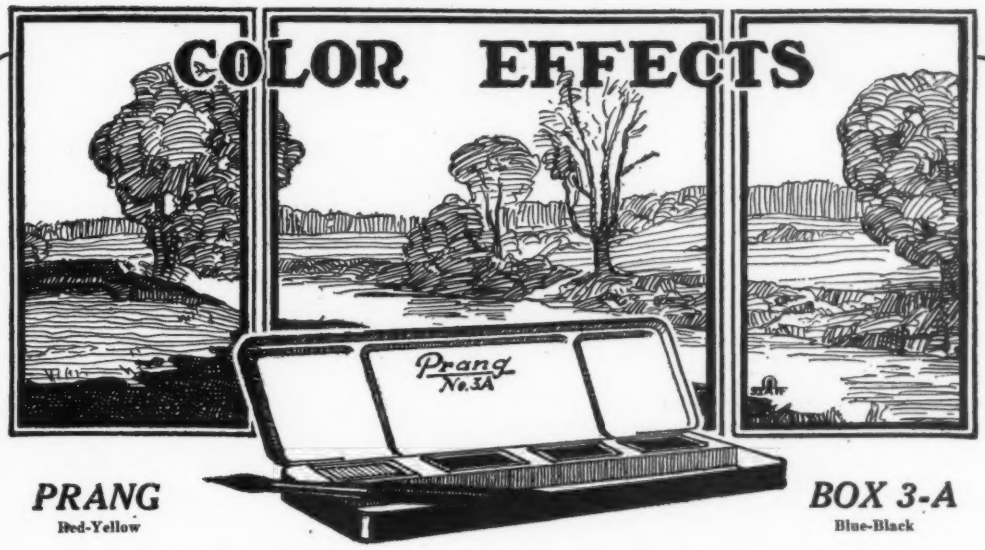
A special circular has been prepared and will be sent to any reader of the Magazine.

History of the File. The average mechanic who uses files in metal or wood working rarely thinks of the history of this humble but interesting tool. The oldest human records which have been found in Asia and America invariably include files or rasps among the remains of primitive civilization. The file has played an important part in the industrial life of every nation from the earliest times to the present. The amount of scientific knowledge and manufacturing skill that enter into the making of a modern file can only be appreciated when all the facts are stated.

To give mechanics, teachers and students a little insight into the interesting story of the file, Henry Disston & Sons, Philadelphia, have just issued an illustrated pamphlet on the history, the making and uses of files. It is available gratis to any reader of the magazine who will request it.

(*Continued on Page* XXXVII)

COLOR EFFECTS



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The long summer session gives opportunity for students to secure a full semester's credit in shop or laboratory courses by lengthening the periods for this work during the summer session. A half semester's credit can be secured in five hour academic courses.

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Chicago Washington Kansas City Omaha St. Louis St. Paul Dallas Seattle

(*Continued from Page* XXXIV)

A Booklet for Chuck Users. The Skinner Chuck Company, New Britain, Conn., manufacturers of chucks for more than thirty years, have just issued a booklet entitled "Chucks and Their Uses."

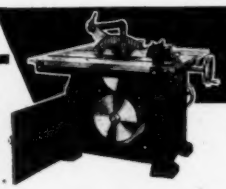
The booklet is intended to offer the machinery buyer, the student, apprentice and mechanic a compact, and authoritative fund of information on standard types of chucks and their uses. It begins with a history of chucks and their development and proceeds to tell in detail, about the various types of chucks, their uses, adaptability and special advantages. Suggestions are given on the proper fitting of chucks to a lathe and on the care of chucks. An interesting feature is a group of don'ts that will appeal to every practical user. No effort has been spared to make the booklet interesting, instructive and helpful to the apprentice and student.

The Skinner Chuck Company offers to send the booklet without charge to any shop supervisor or director of shop courses who will ask for it.

Joins American Crayon Company. Mr. H. Francis James, who has been for four years head of the Art Department at the Illinois Normal University, has become manager of the Chicago office of the American Crayon Company. In his new capacity Mr. James is visiting schools in the north central states and is filling lecture engagements on art instruction and art principles in normal schools, colleges and at teachers' institutes.

An Extension Spring Rule. The Lufkin Rule Company of Saginaw, Mich., has placed on the market a six-foot extension spring joint rule, which has been designed for taking inside measurements of openings such as door and window frames and similar fixed points. The rule is somewhat similar in pattern to the spring joint rule and may be used as a common rule for ordinary measuring.

The rule is known as No. x8536 and is fitted with a graduated brass slide, which extends readily but is not loose and cannot fall out. The boxwood sections are somewhat heavier than those of a common spring joint and are securely fastened at joints, making the rule more rigid when extended than the folding rule. The graduation is in consecutive inches and sixteenths, both sides, and has distinct lines and figures.



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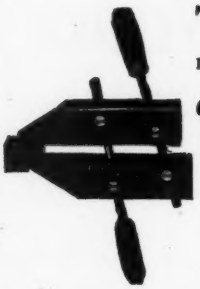

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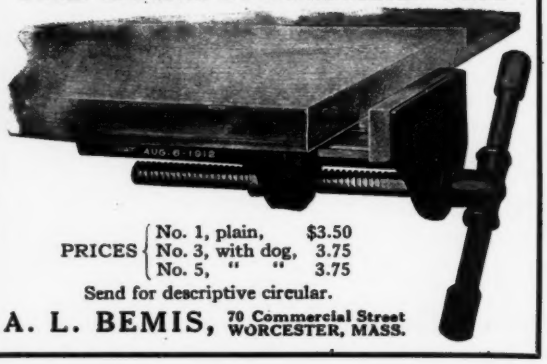

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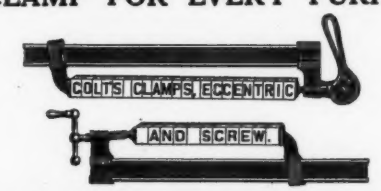

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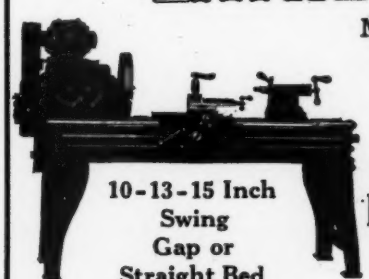

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